Draft AGENDA
DENKA NATA Community Meeting
May/June 2016
6:30 to 8:30 PM

6:30 **Welcome by Parish President/Mayor and LDEQ; Introduction of Colleagues**

Parish President/ Mayor of La Place, Louisiana

LDEQ – Dr. Chuck Carr-Brown

LDHH

EPA

DENKA

DUPONT

- Parish President?
- State Representative?
- Ron Curry, Environmental Protection Agency (EPA) Regional Administrator
- EPA (OAQPS, R6, ATSDR) and State Personnel as appropriate
- DENKA Plant Manager Jorge Lavatista

6:35 **Agenda Review AND GROUNDRULES**

- PROFESSIONAL FACILITATOR

6:40 **Background and Summaries**

WHAT IS NATA AND WHY IS IT IMPORTANT?

- National Air Toxics Assessment Overview:
  - ➢ Kelly Riemer to give history and summary of NATA program
  - ➢ Kelly to summarize NATA for La Place LA

WHY IS MORE ACTION NEEDED?

WHAT ACTION IS BEING TAKEN?

- Summary of LDEQ air sampling
  - ➢ Lourdes Iturralde??
- Summary of EPA Air Sampling to date
  - ➢ Fran Verhalen??

- DENKA Summary of DENKA Activities
  - ➢ Jorge Lavatista
- WHAT DOES THIS MEAN TO MY HEALTH? IS IT SAFE?
  - ➢ LDHH
- Summary of Risk information
  - ➢ Jon Rauscher?
  - ➢ NEED TO ADDRESS NEARBY SCHOOLS

- WHAT CAN I DO IF I HAVE OTHER CONCERNS? WHERE CAN I GO FOR MORE INFORMATION?
    - Parish EMERGENCY MANAGER???
    - LOCAL HEALTH DEPARTMENT
    - ONLINE SERVICES (EPA WEBSITE, LAPLACE INFORMATION, TELE #S)

7: 50 WHAT HAPPENS NEXT? Next Steps and Future Actions

WHAT INFORMATION ARE WE GATHERING AND WHY?

- Future air sampling
- OAQPS – National Rulemaking
- LDEQ – New criteria??
- LHH – Health Assessment??

WHAT IS THE SCHEDULE?

HOW DO I STAY UPDATED?

- Development of a Citizens Advisory Group
- Data and Information Posting (LDEQ or EPA??)
- Future meetings

8:10 Question and Answer Period (WE NEED TO CONSIDER A TRAINED FACILITATOR)

8:25 Closing Comments by Parish President/Mayor and Dr. Carr-Brown

8:30 Meeting Adjourned

(Presenters stay at front of room so that people that are uncomfortable asking a question in the meeting can approach the experts after the meeting)

Message

From: Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent: 7/5/2016 1:06:29 PM
To: 'Gregory Langley' [Gregory.Langley@LA.GOV]; Bijan Sharafkhani [Bijan.Sharafkhani@LA.GOV]; Chuck Brown [Chuck.Brown@LA.GOV]; Lourdes Iturralde [Lourdes.Iturralde@LA.GOV]; June.Sutherlin@la.gov; herman.robinson@la.gov; Elliott Vega (DEQ) [Elliott.Vega2@LA.GOV]; Karyn Andrews [Karyn.Andrews@LA.GOV]; Denise Bennett [Denise.Bennett@LA.GOV]; Hansen, Mark [Hansen.Mark@epa.gov]; robottom@sjbparish.com; Jimmy Guidry (DHH) [Jimmy.Guidry2@LA.GOV]; Payne, James [payne.james@epa.gov]; Blevins, John [Blevins.John@epa.gov]; Stenger, Wren [stenger.wren@epa.gov]; 'Baileigh Rebowe' [b.rebowe@sjbparish.com]; 'Robert Johannessen' [Robert.Johannessen@la.gov]; Tim Beckstrom (DEQ) [Tim.Beckstrom@la.gov]; Jean.Kelly@la.gov; Davis, Alison [Davis.Alison@epa.gov]; Curry, Ron [Curry.Ron@epa.gov]
Subject: RE: LDEQ's talking points for July 7 meeting
Attachments: SJB DENKA v2.pdf

Good morning –

I hope everyone had a nice holiday weekend. I sure did and now it is time to turn back to this week's public meeting. Our EPA team added a few notes to the meeting agenda and wanted to share them with the larger group. As I mentioned in my email on Friday, the website is live at https://www.epa.gov/la/laplace-st-john-baptist-parish-louisiana . We will plan to promote it at the meeting and connect to our main homepage www.epa.gov/region6 on Thursday morning before the meeting. We will work with LDEQ and the Parish to link to our information page. In addition, we created a general information flyer to hand out at the meeting (attached). Please let us know if you have any comments or changes.

I know we have at least two conference calls in advance of the meeting on Thursday night at 6:30 pm in LaPlace. One this morning and another tomorrow morning. Please let me know if you need EPA on any additional calls or pre-meetings with local officials prior to the public meeting. Most of our representatives will fly into New Orleans on Thursday early afternoon.

Regards,

David Gray
Director
EPA External and Government Affairs
214.789.2619 cell

AGENDA
LDEQ/EPA PUBLIC INFORMATIONAL COMMUNITY MEETING
JULY 7, 2016
6:30PM TO 8:30 PM

Outline of topics/issues to be covered in each presentation

6:30 pm WELCOME – Parish President, LDEQ Secretary, EPA Region 6 Administrator

- Unified show of support for community by high level political appointees.
- Working with Parish, state and federal agencies, and the company to understand the issues and plan how to proceed.

6:40 pm Purpose of Meeting- Dr. Brown, LDEQ and Ron Curry, EPA Region 6

- To tell audience what we know, how we know it, what we plan to do next.

- Demonstration of willingness to listen, commitment to follow-up with community with updates on data and potential subsequent actions. , contact info.
- Want to hear community's concerns.

6:55 pm Overview of National Air Toxic Assessment – EPA

- OAQPS to describe basic information about NATA, its uses as a screening model.
- Basic information about chloroprene, where it comes from, potential health effects.
- What we look for in the NATA screening analysis in terms of benchmarks, results from LaPlace.
- Why these results led us to confer with the Region, the state, and Denka.
- Here to verify model results with measurement data.

7:10 pm EPA Sampling Results Summary and Ongoing Activities - EPA Region 6

- How do we monitor (hopefully have a cannister to show)
- What we have done to date – where and when
- Results of monitoring
- Longer-term monitoring plans – where and when. What we will compare longer-term levels to – 0.2

7:25 pm Tumor Registry - LDH

- Incidence rates for the Parish are in line with state and national values.
- New data and potency value for chloroprene means more needs to be done to prevent possible long term health impacts

7:40 pm Summary of Denka's Activities in response to NATA- Denka

- Denka's message should be focused on a path forward to reducing emissions working with LDEQ and EPA.
- Past experience indicates that they may disagree with the potency value for chloroprene. Hopefully, the company will continue to address this outside of the meeting since monitoring values are high.

7:55 pm Question and Answer Session- Moderator

Information for the facilitator:

Questions to go to Dr. Brown

- Questions about any potential mitigation plans
- Questions about state activities

Questions to go to Dr. Guidry

- Questions about health and medical

Questions to go to EPA Curry:

- Questions about EPA general activities

Questions to go to EPA Kelly Rimer:

- About NATA, and about NATA results
- About how the monitoring benchmarks (this is the 0.2 number) were developed.

Questions to go to EPA John Vandenberg from ORD:

- Questions about the type of cancer and noncancer health effects of chloroprene
- Questions about the studies reviewed to determine the potency factor – the number that shows us how toxic chloroprene is to humans.

Questions to go to EPA Fran Verhalen from Region 6:

- Questions about monitoring actions to date in terms of collaboration with Denka, data requests, and collaboration with LDEQ.

8:20 pm Next Steps/Closing Remarks- Dr Brown, LDEQ and Ron Curry, EPA Region 6

8:30pm Meeting Adjourned (EPA and LDEQ Representatives stay after meeting to be available for further questions)

COMMUNITY RESOURCES

from Lousiana Department of Environmental Quality, EPA and local officials

Denka Performance Elastomer LLC
St. John the Baptist Parish

LEARN

- About Chloroprene
- About National Air Toxics Assessment (NATA)
- About 2011 NATA Results in SJB Parish
- About Air Monitoring
- About Air Monitoring Results

ACTION

- Updates on air monitoring in the community
- Updates on state and federal activities
- Updates on company activities
- Updates on health information
- Federal, state and local contacts

▶ NATA analysis is used to identify areas with potentially high risk where additional action may be needed.

▶ EPA and LDEQ are acting on the NATA information in partnership with the local community and with the cooperation of sources in the area.

▶ LDEQ requested Denka formulate modeling and monitoring plans and develop actions to reduce emissions.

DEQ LOUISIANA

For more information from St. John the Baptist Parish, State of Louisiana and EPA, visit our dedicated information page at www.epa.gov/region6.

Toll-free: 800.887.6063, M-F 9 am - 4 pm

Email: R6_SJB@epa.gov

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Message

From: Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent: 7/1/2016 3:34:28 PM
To: 'Gregory Langley' [Gregory.Langley@LA.GOV]; 'Robert Johannessen' [Robert.Johannessen@la.gov]; 'Baileigh Rebowe' [b.rebowe@sjbparish.com]
Subject: RE: DENKA, St John the Baptist website
Attachments: SJB DENKA v2.pdf

We are making progress – but slower than we anticipated. I will keep you posted.

Here is a general handout that we are proposing for next week's meeting to support the website and share some information. Please let me know if you have any comments or changes.

David

From: Gray, David
Sent: Thursday, June 30, 2016 8:09 AM
To: 'Gregory Langley' <Gregory.Langley@LA.GOV>; 'Robert Johannessen' <Robert.Johannessen@la.gov>; 'Baileigh Rebowe' <b.rebowe@sjbparish.com>; Gray, David <gray.david@epa.gov>
Subject: DENKA, St John the Baptist website

We are getting close to launching the new website on DENKA in St John the Baptist Parish. Unfortunately, I can't figure out a way for you all to see it on our secure servers. So – it will have to be pushed to our public server www.epa.gov to make it viewable for each of you. It is unlikely to get much attention until we hotlink it to our home page and publicly announce its availability. I will send you the specific web link so you can look at it. If there are any changes needed – we can make them tomorrow. Special note – our internet is undergoing maintenance this weekend and the server will be locked from any changes from July 2 to July 4. No changes can be made during this period of time.

Best,
David

David Gray
Director
EPA – External and Government Affairs
214.789.2619 cell

Message

From: Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent: 7/1/2016 1:45:54 PM
To: 'Gregory Langley' [Gregory.Langley@LA.GOV]
Subject: quick view

Greg – here are the items that we have so far for DEQ. I will add the LDEQ approval of the monitoring plan letter that I got late yesterday. You won't be able to open any of them until I post to web – but this will give you an idea. I see one typo already and will fix it.

David

LaPlace, Louisiana - LDEQ Response - DRAFT

The Louisiana Department of Environmetal Quality (LDEQ) is actively working with EPA and officials from Denka Performance Elastomer (DPE) to address the chloroprene issues in LaPlace, Louisiana. LDEQ staff have met with DPE officials and requested that the company formulate modeling, a monitoring plan and develop emissions reduction actions.

From March 2 through March 9, 2016, LDEQ and EPA collected preliminary air samples in multiple locations surrounding DEP. Learn more.

You will need Adobe Reader to view some of the files on this page. See EPA's About PDF page to learn more.

- LDEQ Letter to DPE (PDF)(3 pp, 1 MB, May 27, 2016)

  Letter with comments on DPE's air quality modeling protocol and fenceline monitoring

- DPE Counsel Letter to LDEQ (PDF)(4 pp, 99 K, May 16, 2016)

  Prepared by DPE's legal counsel to respond to LDEQ's verbal request to perform a chloroprene risk assessment

- DPE Fenceline Area Monitoring Protocol (PDF)(4 pp, 581 K, May 6, 2016)

  DPE response to LDEQ's March 2016 verbal request

- DPE Draft Air Quality Modeling Protocol for Chloroprene (PDF)(10 pp, 5 MB, April 13, 2016)

  Prepared by DPE in response to LDEQ's additional information request

Message

From: Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent: 7/29/2016 1:50:06 PM
To: 'Natalie Robottom' [robottom@stjohn-la.gov]; Baileigh Rebowe [b.rebowe@stjohn-la.gov]; Gregory Langley [Gregory.Langley@LA.GOV]; Bijan Sharafkhani [Bijan.Sharafkhani@LA.GOV]; Chuck Brown [Chuck.Brown@LA.GOV]; Lourdes Iturralde [Lourdes.Iturralde@LA.GOV]; June.Sutherlin@la.gov; herman.robinson@la.gov; Elliott Vega (DEQ) [Elliott.Vega2@LA.GOV]; Karyn Andrews [Karyn.Andrews@LA.GOV]; Denise Bennett [Denise.Bennett@LA.GOV]; Hansen, Mark [Hansen.Mark@epa.gov]; Jimmy Guidry (DHH) [Jimmy.Guidry2@LA.GOV]; Payne, James [payne.james@epa.gov]; Blevins, John [Blevins.John@epa.gov]; Stenger, Wren [stenger.wren@epa.gov]; Robert Johannessen [Robert.Johannessen@la.gov]; Tim Beckstrom (DEQ) [Tim.Beckstrom@la.gov]; Jean.Kelly@la.gov; Davis, Alison [Davis.Alison@epa.gov]; Curry, Ron [Curry.Ron@epa.gov]; Megan Collins [m.collins@stjohn-la.gov]
Subject: LaPlace News Article

Good morning -- I wanted to share a copy of this news article with you.

David

NOTE: Inside EPA is not a federal government publication. It is a privately operated news service that covers environmental issues and is published out of Arlington, VA.

InsideEPA.com is a product of Inside Washington Publishers, which for over 30 years has provided exclusive, relevant news about the federal policymaking process to professionals who have a need to know about the process. Because of the pervasive nature of federal environmental policy, our coverage extends to state activities and international issues. Formed in 1980 with the publication of Inside EPA Weekly Report, IWP currently publishes 22 newsletters and eight online news services. It has groups of news services covering environment, defense, international trade, health care, energy and cybersecurity.

Inside EPA - 07/29/2016

EPA, State Pursue Novel Use Of NATA To Push For Facility Emissions Cuts

July 27, 2016

EPA and Louisiana air regulators are taking the novel step of using air pollution data from the agency's latest National Air Toxics Assessment (NATA) to scrutinize toxic emissions from an industrial facility and push for voluntary pollution cuts, which observers say could encourage other states to use the data to target industry air toxics.

"It's an unusual step -- I've never before had brought to my attention a specific facility that rises to the level of concern under the National Air Toxics Assessment," says one environmentalist who works with air pollution issues nationwide. The source says NATA data is generally seen as not granular enough to support such a focus on a specific industrial facility, making the action in Louisiana rare -- if not the first of its kind nationwide.

NATA is an influential study on the state of air toxics emissions across the country that many state regulators rely on to guide their decisions. The agency issues the NATA periodically, and is often under pressure from states to issue updates more frequently to make the data more relevant. EPA most recently issued an update Dec. 17, which was informed by 2011 emissions data. It is unclear when the agency will release the 2014 NATA.

EPA on its website says the NATA data should "be used cautiously, as the overall quality and uncertainties of the assessment will vary from location to location as well as from pollutant to pollutant."

The agency says that NATA can be used for several purposes including identifying air toxics of the greatest concern; improving the understanding of health risks from air pollution; and helping set priorities for collecting of additional emissions data. But EPA also warns that NATA should not be used "as a definitive means to pinpoint specific risk values within a census tract," or as the sole basis to control specific emissions sources.

Nevertheless, EPA and Louisiana regulators are using the 2011 NATA to target emissions from a LaPlace, LA, elastomer plant -- a novel use of the air toxics data to support specific compliance action rather than broader strategic efforts that could signal new scrutiny of individual facilities based on the data released in 2015.

Spokespeople for EPA headquarters and Region 6 told Inside EPA July 13 that the agency is stepping up air monitoring at the Denka Performance Elastomer (DPE) plant in LaPlace and working on voluntary emissions cuts based on NATA data showing high levels nearby of the likely carcinogen chloroprene. There appear to be no other potential sources of the air toxic chloroprene anywhere else in the region, leading to the focus on the DPE plant.

DPE, which produces the rubber substitute elastomer, tells Inside EPA however that it might seek revisions to EPA's 2010 risk assessment that identified chloroprene as a carcinogen.

According to an EPA headquarters spokeswoman, the agency's work with DPE is the only compliance action it has taken so far based on the 2011 NATA released last year.

But the environmentalist says EPA's action in Louisiana could spur other groups to examine facilities across the United States where NATA data might help target emissions of concern from particular plants.

EPA is also stepping up use of NATA for environmental justice (EJ) actions, announcing in June that it added data from the assessment to its EJ screening tool, known as

EJSCREEN. While the overall NATA was already published, the update means the EJ tool now includes air toxics risk screening data previously available only to agency staff.

Yet regulators and advocates say that NATA alone is not enough to support compliance action at facilities; rather, the data only shows a need to conduct more intensive monitoring and confirm high risks to nearby communities.

In a July 12 interview with Inside EPA, Louisiana Department of Environmental Quality (LDEQ) Press Secretary Greg Langley said that when regulators examined the NATA maps released on Dec. 17, "There was a large area of red, which indicates a cancer risk, in LaPlace" that spurred them to reach out to EPA and DPE's management, Langley said.

But rather than moving directly to implement new air toxics controls, Langley said that due to the limited data "first we need to do more monitoring to get a better sense of exactly what it is we're looking at."

A second environmentalist, at WE ACT for Environmental Justice, says the group has "never seen it before," referring to the use of NATA for individual compliance. That group has found municipal emissions data to be "much more indicative" of which facilities need specific attention, the source says.

The high cancer risk signaled by the 2011 NATA data in LaPlace is from emissions of chloroprene, which is a byproduct of the elastomer production process and which EPA classified as a likely human carcinogen in 2010.

LDEQ and EPA are now in the fourth month of a six-month monitoring plan to more accurately assess chloroprene emissions from DPE, while the facility itself is stepping up its modeling of air releases and investigating new control technologies including improved leak detection that could reduce risk to nearby communities.

However, LDEQ's Langley told Inside EPA that regulators have limited options to require those controls if modeling and monitoring efforts bear out the NATA data because EPA has promulgated only a health advisory level of 0.2 micrograms per cubic meter. "There is not an enforceable standard . . . We don't have a cudgel to hold over them," he said.

DPE meanwhile is signaling that it may seek revisions to the 2010 risk assessment that classified chloroprene as a likely carcinogen, which if successful could negate the NATA warnings of cancer risk from the LaPlace facility's air emissions.

Jorge Lavastida, DPE's executive officer and plant manager told Inside EPA July 20 that "We are working with toxicologists at Ramboll Environ to review the 2010 inhalation Unit Risk Estimate (URE), which was used in the NATA study."

Lavastida said the toxicology firm "has advised DPE that it believes there are a number of reasons to update and substantially reduce the 2010 URE," and is seeking a meeting with staff from EPA's Integrated Risk Information System program "to discuss the scientific rationale for an updated URE." -- David LaRoss

Inside EPA - 07/29/2016 , Vol. 37, No. 30

193378

Message

From: Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent: 2/26/2019 3:55:18 PM
To: Gregory Langley [Gregory.Langley@LA.GOV]
Subject: FW: Article: Government unlikely to ever enforce emission threshold for St. John plant, EPA official says

https://www.theadvocate.com/new_orleans/news/environment/article_9c227db8-3950-11e9-924d-b30685199949.html

Government unlikely to ever enforce emission threshold for St. John plant, EPA official says

- BY NICK REIMANN | NREIMANN@THEADVOCATE.COM

- FEB 25, 2019 - 7:00 PM

Residents of St. John the Baptist Parish pushing for a federally mandated limit on chloroprene emissions from a LaPlace chemical plant are unlikely to get it, according to an official from the U.S. Environmental Protection Agency.

In a presentation to parish residents and environmental activists last week, David Gray, EPA deputy administrator for the region that includes Louisiana, said that despite the agency's 2015 classification of chloroprene as a "likely carcinogen," and continuing EPA monitoring of the air at several sites in the parish, federal regulators are not embarking on the rule-making process that could eventually result in a federal limit on emissions.

The Denka Performance Elastomer plant, which is the focus of numerous lawsuits claiming it has made many residents sick, has reduced its chloroprene emissions by over 85 percent in the past year, a goal set by the Louisiana Department of Environmental Quality, Gray said.

But that reduction has not brought emissions of the chemical below the level of 0.2 micrograms per cubic meter of air deemed safe by the EPA.

“They’ve made their 85 percent (goal). It’s just not sufficient to get to the 0.2,” Gray said.

“I don’t even want to pretend that’s a satisfying answer."

Gray’s presentation, which was met by groans and gasps from residents at the meeting, highlighted the complicated, and sometimes conflicting, relationship between state and federal environmental monitoring and regulations.

The EPA set its 0.2 micrograms threshold for safe, long-term human exposure to the chemical in 2010 — five years before its National Air Toxics Assessment report found that St. John Parish had the highest risk of cancer from airborne pollutants of any place in the U.S., largely because of chloroprene.

In response to that assessment, the EPA set up six air monitoring stations in St. John; they went online in May 2016, reporting air samplings every three days. Those samplings found that chloroprene in the air sometimes was hundreds of times above the 0.2 threshold.

In January 2017, Denka and LDEQ — which is responsible for permitting production at the plant — signed a consent agreement for Denka to install $30 million in equipment to lower emissions.

The plant started operating with that equipment in March 2018, and EPA data showed an immediate reduction in chloroprene levels in the air.

Gray said the government is in a difficult position because Denka met the emission reduction goal set in an agreement with LDEQ, but emissions are still well above the threshold the EPA suggests.

Wilma Subra, an activist with the Louisiana Environmental Action Network, said the EPA could still seek to get chloroprene categorized under "air toxics," which would force compliance with the 0.2 micrograms threshold. However, that designation requires congressional approval, and Subra said she wouldn't expect any local representative to sponsor it.

Gray said it's almost certain the EPA won't go through the effort to set an official standard for chloroprene because it would take years and the LaPlace plant is the only one in the U.S. that produces chloroprene for neoprene, a synthetic rubber product found in wetsuits.

He said the EPA hopes to keep working with Denka to have the company itself continue reducing emissions.

Residents at last week's meeting, held at a chapel in Reserve, had been hoping Gray would bring some good news of federal action. Robert Taylor, leader of the group Concerned Citizens of St. John, was especially upset by the presentation.

"They can't protect 400 black kids in Reserve from this monstrous plant?" an irate Taylor said. "I wouldn't dare sell my house to a human family. I wouldn't dare bring another human family into this."

[St. John plaintiffs file amended suit against Denka citing specific health problems]

Gray also said the EPA will stop reporting air monitoring data every three days on March 1, when it will start reporting the data every six days. There won't be a change in the amount of information collected — just how often it's reported and made publicly available, he said.

Gray said that change was due to budgetary concerns but that it also marks a whole year with data reported on the three-day basis since the regenerative thermal oxidizer was installed at the plant.

He reassured the community the EPA will continue efforts to help and that it's committed to funding air monitoring through the end of 2019.

"You have my commitment to be an advocate," Gray said. "From the agency's standpoint, we don't feel like we're done."

Gray said the EPA views the St. John community as "at risk" and will continue to do research on chloroprene, "until the science proves that the number (for safe exposure) is 0.3, 0.1 or whatever it ends up, and we're able to continue reducing reductions to get you at that level."

A federal court lawsuit by 13 members of Concerned Citizens of St. John demands that the plant either shut down or significantly reduce its production until chloroprene levels across St. John Parish reach the 0.2 threshold.

That's one of 10 lawsuits against the plant in either state or federal court.

LDEQ is also named as a defendant in some of the suits. A spokesman there declined to comment on the Denka plant because of the pending litigation.

Message

From: Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent: 7/18/2019 3:17:17 PM
To: Chuck.Brown@LA.GOV
Subject: FW: DPE Request for Reconsideration (RFR) #17002A
Attachments: Chloroprene RFR #17002A CIO interim 07172019v3 pdf.pdf

I am providing you with the CIO's letter that was sent concerning DPE's submitted Request for Consideration and the related work concerning the external peer review of the PBPK model. At this juncture, the CIO has paused consideration of the RFR until after the conclusion of the peer review process.

Message

From: Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent: 2/26/2019 11:56:49 PM
To: Gregory Langley [Gregory.Langley@LA.GOV]
Subject: Response

Greg,
I have some questions from Times Picayune re: Denka and I wanted you to have a copy of my response to them. It will go out shortly. I am on my cellphone if you need me.
David

Denka continues to say that it is in compliance with the 857 micrograms per cubic meter air quality standard for chloroprene now in Louisiana state law. Is that accurate?
The community monitoring indicates that the company is in compliance with the 857 micrograms per cubic meter ambient air standard under Louisiana Air Toxics program. However, Denka is the only known emitter of chloroprene in the area and we are interested in determining whether there are underreported and/or under controlled emissions from the plant.

If so, how does that follow with the EPA's recommendation that "At a minimum, we recommend that this facility aims for emission reductions such that the maximum annual average chloroprene concentration is no higher than 0.2 uG/m3 at the highest modeled off-site location. That being said, it is preferable to have the chloroprene concentration at the highest modeled census block as close to 0.002 ug/m3 as reasonably achievable." (May 5, 2017 memo from Kelly Rimer to Frances Verhalen).
There are two different ideas being compared here: the state only regulatory limit of 857 ug/m3 ambient air standard under Louisiana Air Toxics program and the non-regulatory long-term cancer risk value for chloroprene (0.2 for potentially 100 new cases in 1,000,000 persons). At this time, EPA is not anticipating a change to the federal Polymer and Resins MACT. Regarding the non-regulatory cancer risk value, Denka is developing a physiologically-based pharmacokinetic PBPK model for chloroprene and is expected to send information to EPA before May 1, 2019.

And what is the status of EPA's role in regulating Denka's plant, in relation to Louisiana DEQ's role?
I see from EDMS records that the past two monthly air emissions reports by Denka show that fenceline monitoring results remain more than 10 times greater than that "no higher" level, and that there remain some community sites that are measuring chloroprene above the 0.2 level and most are above the 0.002 level.
Does EPA consider those levels to be a concern, and if so, what actions can the agency take to deal with them?
The federal air permitting program is delegated to LDEQ in Louisiana, and EPA is working jointly with LDEQ and Denka continue to discuss emission control options that could further reduce chloroprene concentrations in the community.

And aside from the LDEQ-Denka AOC, are there any other enforcement actions that have been taken by EPA itself in response to the June 2016 NEIC investigation and following reports? Are any other regulatory actions based on the NEIC planned?

The areas of noncompliance noted in the 2016 NEIC inspection report have been referred to the Department of Justice for civil enforcement. EPA, DOJ, LDEQ, Denka, and DuPont are in the process of negotiating a settlement of those NEIC claims. We are not aware of any other regulatory actions being planned based on the NEIC.

Message

From: Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent: 8/14/2018 1:35:09 PM
To: Gregory Langley [Gregory.Langley@LA.GOV]
Subject: For tonight
Attachments: 2014 NATA LaPlace.pdf

Gregory,
Hope you are well. I wanted to share this handout with you. I plan on using it tonight in anticipation of the next round of NATA release soon.
David

David Gray
Deputy Regional Administrator (acting)
EPA Region 6 – Dallas
(214) 665-2100 office
(214) 665-8120 direct
(214) 789-2619 cell
gray.david@epa.gov

2014 NATA – LaPlace, Louisiana

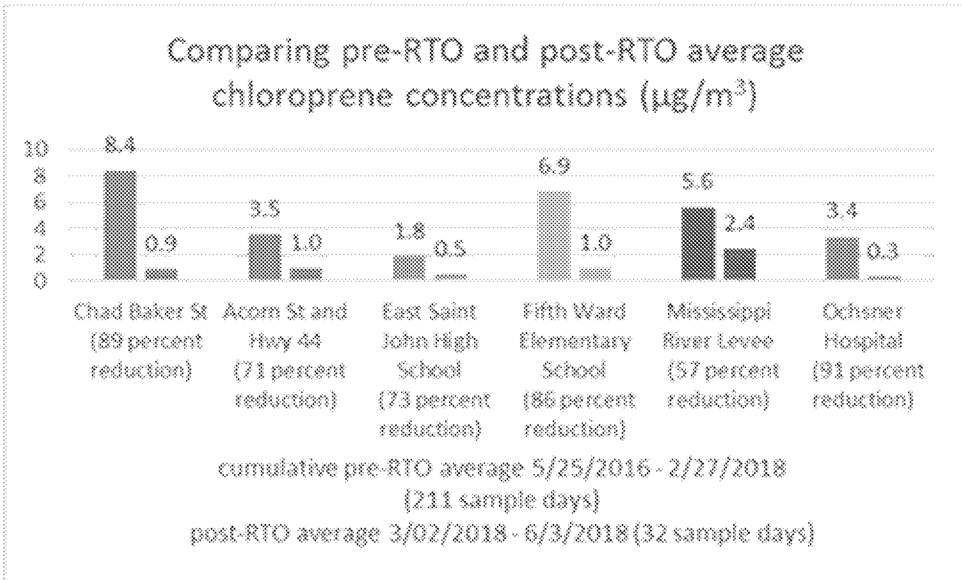
Because the emissions reductions at Denka Performance Elastomers, LLC (Denka) in LaPlace happened after 2014, the resulting risk reductions are not reflected in the 2014 National Air Toxics Assessment (NATA) for the New Orleans-Metairie, LA, MSA.

Since the 2011 NATA release, the Louisiana Department of Environmental Quality (LDEQ), the EPA and Denka have increased sampling, monitoring, enforcement actions, and corrective actions to address chloroprene emissions.

The EPA and LDEQ conducted field sampling of the air around Denka and confirmed elevated concentrations of chloroprene. Consequently, EPA established six monitoring locations surrounding the Denka facility. These monitors collect 24-hour samples every three days. Values collected range from non-detect to more than 150 micrograms per cubic meter ($\mu g/m^3$) chloroprene.

In January 2017, Denka signed an agreed order on consent with LDEQ to install control measures to reduce chloroprene emissions. By March 1, 2018, all control technologies were in place and operational.

While we need to collect more data before drawing conclusions about the installment of Denka's control technologies, early air monitoring results have been encouraging. They show 57 to 91 percent reductions in recorded average chloroprene values, compared to pre-control levels.



The 2011 NATA was released in December 2015. The report identified LaPlace, LA, as a community with potentially higher risk of developing cancer due to the chemical, chloroprene. LaPlace is located within the New Orleans-Metairie, LA, metropolitan statistical area (MSA). The Denka plant was identified as the source of chloroprene emissions.

Message

From: Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent: 4/13/2018 7:23:52 PM
To: Robert Johannessen [Robert.Johannessen@la.gov]
CC: Gregory Langley [Gregory.Langley@LA.GOV]; Jimmy Guidry (LDH) [Jimmy.Guidry2@LA.GOV]; Raoult Ratard [Raoult.Ratard@LA.GOV]; Dianne Dugas [Dianne.Dugas@LA.GOV]; White, Luann E [lawhite@tulane.edu]
Subject: Re: E-Alert - Cancer Incidence Rates by Census Tract in St John the Baptist Parish, 2006-2014 Posted on 04/13/2018

Thank you. On flight from DC

Sent from my iPhone

On Apr 13, 2018, at 2:17 PM, Robert Johannessen <Robert.Johannessen@la.gov> wrote:

> David,
>
> As an FYI, our team has spoken to The Advocate in Baton Rouge and WWI-TV in NOLA. On both instances, we said this about chloroprene exposure and cancer data.
>
> **We do not see a correlation between exposure to chloroprene and a higher risk of cancer.**
>
> **We are focused on cancers that may be attributable to chloroprene exposure.**
>
> **There are only 2 - lung cancer and liver cancer.**
>
> **For both of these cancers, the rates - as shown by data from the Louisiana Tumor Registry - are not elevated.**
>
> **This is consistent when the cancer rates are analyzed at the parish level, and it is true when looking at the census tract level.**
>
> **This information is good news as we recognize that residents who live, work and go to school near the plant are concerned about exposure, and worried this exposure might cause cancer.**
>
> **The good news, as shown by this new data, is that cancers that are linked to chloroprene exposure are not elevated.**
>
> **You asked about the rates for the category of "all cancer." I would encourage you to ask the Tumor Registry how that information was compiled and what cancers rates are included in that calculation and measure.**
>
> **But, again, the important cancers to be concerned about when it comes to chloroprene exposure are lung cancer and liver cancer. And, neither of those are elevated.**
>
> **Our agency will continue to study this most recent data, as we recognize that exposure is occurring.**
>
> **We will work with and consult with the DEQ and the EPA to review new air monitoring data since Denka installed new emission controls.**
>
> Bob

Robert Johannessen
Communications Director | Bureau of Media and Communications
Louisiana Department of Health
robert.johannessen@la.gov
Office: 225-342-5275| Cell: 225-715-6109

From: Gregory Langley
Sent: Friday, April 13, 2018 12:12 PM
To: Robert Johannessen <Robert.Johannessen@la.gov>
Subject: Fwd: E-Alert - Cancer Incidence Rates by Census Tract in St John the Baptist Parish, 2006-2014 Posted on 04/13/2018

Sent from my iPhone

Begin forwarded message:

> **From:** "Gray, David" <gray.david@epa.gov>
> **Date:** April 13, 2018 at 12:07:44 PM CDT
> **To:** Gregory Langley <Gregory.Langley@LA.GOV>
> **Subject: Fwd: E-Alert - Cancer Incidence Rates by Census Tract in St John the Baptist Parish, 2006-2014 Posted on 04/13/2018**
>
> Sent from my iPhone
>
> Begin forwarded message:
>
>> **From:** Louisiana Environmental Action Network <contact@leanweb.org>
>> **Date:** April 13, 2018 at 12:02:28 PM CDT
>> **To:** david <gray.david@epamail.epa.gov>
>> **Subject: E-Alert - Cancer Incidence Rates by Census Tract in St John the Baptist Parish, 2006-2014 Posted on 04/13/2018**
>> **Reply-To:** Louisiana Environmental Action Network <contact@leanweb.org>

Louisiana Environmental Action Network &
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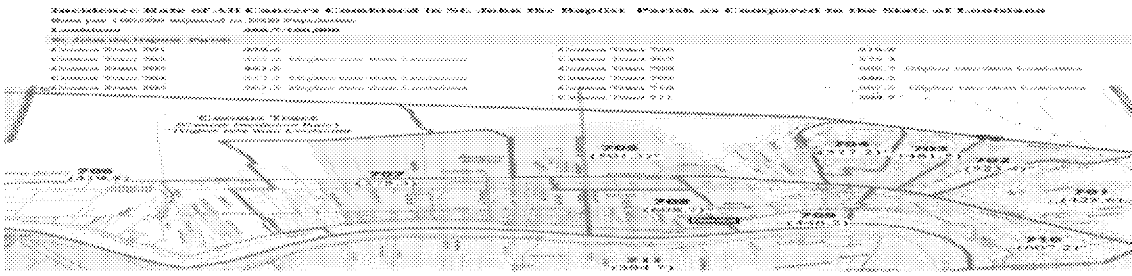
Cancer Incidence Rates by Census Tract in St Joh
the Baptist Parish, 2006-2014



Cancer Incidence in Louisiana and St. John the Baptist Parish by Census Tract
2006 - 2014

Louisiana Tumor Registry

March 2018

Compiled by Wilma Subra

Louisiana Environmental Action Network

April 8, 2018

Incidence Rate of All Cancers Combined in St. John the Baptist Parish as Compar to the State of Louisiana

Rate per 100,000 adjusted to 2000 Population

Louisiana	**486.7/100,000**
St. John the Baptist Parish	
Census Tract 701	428.6
Census Tract 702	523.4 Higher rate than Louisiana
Census Tract 703	481.5

Census Tract 704	517.2	Higher rate than Louisiana
Census Tract 705	501.3	Higher rate than Louisiana
Census Tract 706	419.8	
Census Tract 707	375.3	
Census Tract 708	608.7	Higher rate than Louisiana
Census Tract 709	446.2	
Census Tract 710	607.2	Higher rate than Louisiana
Census Tract 711	394.7	

Significantly Higher Cancer Incidence Rate of All Cancers Combined in St. John t Baptist Parish as Compared to the State of Louisiana

Rate per 100,000 adjusted to 2000 Population

Louisiana	**486.7/100,000**
St. John the Baptist Parish	
Census Tract 708	608.7
Census Tract 710	607.2

Both 125 % of rate in Louisiana

Census Tract 708: highest Cancer Risk in the US due to Chloroprene exposure, 776.8 p million individuals

Incidence Rate of Lung and Bronchus Cancers in St. John the Baptist Parish as Compared to the State of Louisiana

Rate per 100,000 adjusted to 2000 Population

Louisiana	**73.7/100,000**	
St. John the Baptist Parish		
Census Tract 702	73.9	Higher rate than Louisiana
Census Tract 703	67.3	
Census Tract 704	89.0	Higher rate than Louisiana
Census Tract 705	61.1	
Census Tract 707	50.6	
Census Tract 708	84.7	Higher rate than Louisiana
Census Tract 710	101.4	Higher rate than Louisiana
Census Tract 711	49.0	

Incidence Rate of Colon and Rectum Cancers in St. John the Baptist Parish as Compared to the State of Louisiana

Rate per 100,000 adjusted to 2000 Population

Louisiana	**50.1/100,000**	
St. John the Baptist Parish		
Census Tract 702	51.1	Higher rate than Louisiana
Census Tract 703	41.4	
Census Tract 705	55.8	Higher rate than Louisiana
Census Tract 706	61.6	Higher rate than Louisiana

Census Tract 707	57.0	Higher rate than Louisiana
Census Tract 708	84.8	Higher rate than Louisiana
Census Tract 710	57.2	Higher rate than Louisiana

Incidence Rate of Prostate Cancer in St. John the Baptist Parish as Compared to t State of Louisiana

Rate per 100,000 adjusted to 2000 Population

Louisiana	**158/100,000**	
St. John the Baptist Parish		
Census Tract 702	272	Higher rate than Louisiana
Census Tract 703	164.6	Higher rate than Louisiana
Census Tract 705	157.2	
Census Tract 707	98.9	

Incidence Rate of Female Breast Cancer in St. John the Baptist Parish as Compa to the State of Louisiana

Rate per 100,000 adjusted to 2000 Population

Louisiana	**122.1/100,000**	
St. John the Baptist Parish		
Census Tract 702	119.0	
Census Tract 703	145.3	Higher rate than Louisiana
Census Tract 704	158.2	Higher rate than Louisiana
Census Tract 705	115.2	

Census Tracts With Reported Rates of Cancer in St. John the Baptist Parish

Eleven census tracts in St. John the Baptist Parish met the criteria for reporti the rate of all cancers combined. The criteria specified there had to be equal to greater than 16 cases of a cancer to be counted. This criteria insured the data d not disclose the identity of any person whose was listed as having cancer. All of eleven census tracts in St. John the Baptist parish with listed rates of cancer per 100,000 population were on the east bank of the parish.

Rate of All Cancers Combined

The eleven census tracts ranged in rates of all cancers combined per 100,000 population from 375.3 for census tract 707 to 608.7 for census tract 708. Census tract 708 consist of most of the Denka facility and residential neighborhoods and Fifth Ward School upstream of the Denka facility.

Two census tracts rated as significantly higher than the Louisiana Rates for all cancers combined. The census tracts were 708 (608.7) (Denka Facility) and 710 (607.2) (down river from Denka). The state rate for all cancers combined was 486 per 100,000. Both of these census tracts were 125% larger than the rate for all cancers combined in the state of Louisiana.

Census tract 708 with the highest rate of all cancers combined, is the census tr with the highest risk of cancer due to exposure to Chloroprene calculated by the National Air Toxics Assessment (NATA) and the Environmental Protection Agency (EPA). The risk per million individuals due to exposure to cancer from Chloropren 776.8 per million and is 800 times the national average for cancer risks associated with Chloroprene (national average 0.968).

Three additional census tracts of the 11 census tracts, exceeded the state rate of cancers combined. These census tracts were census tracts 702 (523.4), 704 (517.2) and 705 (501.3). These census tracts are northeast of the Denka facility.

Thus, five of the 11 census tracts in St. John the Baptist Parish exceeded the state rate for cancers for all cancers combined.

Lung and Bronchus Cancers

Eight census tracts had reported rates of lung and bronchus cancers. The lung bronchus cancers ranged from 49.0 per 100,000 for census tract 711 to 101.4 per 100,000 for census tract 710. Four of the census tracts had lung and bronchus rate over the state of Louisiana rate (73.7 per 100,000). The four census tracts were census tract 702 (73.9), 708 (84.7), 704 (89.0) and 710 (101.4).

Colon and Rectum Cancer

Seven census tracts had reported rates of colon and rectum cancer. The colon rectum cancers ranged from 41.4 per 100,000 for census tract 703 to 84.8 per 100 for census tract 708. Six of the seven census tracts had colon and rectum cancer above the rate of colon and rectum cancers in the state of Louisiana (50.1). The

census tracts were census tract 702 (51.1), 705 (55.8), 707 (57.0), 710 (57.2), 70
(61.6) and 708 (84.8).

Female Breast Cancer

Four census tracts had reported rates for female breast cancer. The female b
cancers ranged from 115.2 per 100,000 for census tract 705 to 158.2 per 100,000
census tract 704. Two of the four census tracts had female breast cancer rates a
the state rate of 122.1 per 100,000. The census tracts were census tract 703 (145
and census tract 704 (158.2).

Prostate Cancer

Four census tracts had reported rates for prostate cancer. The prostate cance
ranged from 98.9 per 100,000 for census tract 707 to 272.0 per 100,000 for censu
tract 702. Two of the four census tracts had prostate cancer rates above the sta
rate of 158.0 per 100,000. The census tracts were census tract 703 (164.6) and ce
tract 702 (272.0).

Census Tract 708

Census tract 708 had the highest risk of cancer due to Chloroprene exposure in
entire United States. Based on the newly released data for cancers in Louisiana b
census tract, census tract 708 had significantly higher cancer risk for all cancers
(608.7 per 100,000) when compared to the state of Louisiana cancer rate (486.7

Census tract 708 had over the Louisiana cancer rate (50.1 per 100,000) for col
and rectum cancer (84.8 per 100,000) and over the Louisiana cancer rate (73.7 pe
100,000) for lung and bronchus (84.7 per 100,000).

The post Cancer Incidence Rates by Census Tract in St John the Baptist Parish, 20
2014 appeared first on Louisiana Environmental Action Network.

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Our mailing address is:

Louisiana Environmental Action Network

162 Croydon Ave

Baton Rouge, La 70816

Add us to your address book

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Dona

Message

From: Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
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> **Reply-To:** Louisiana Environmental Action Network <contact@leanweb.org>

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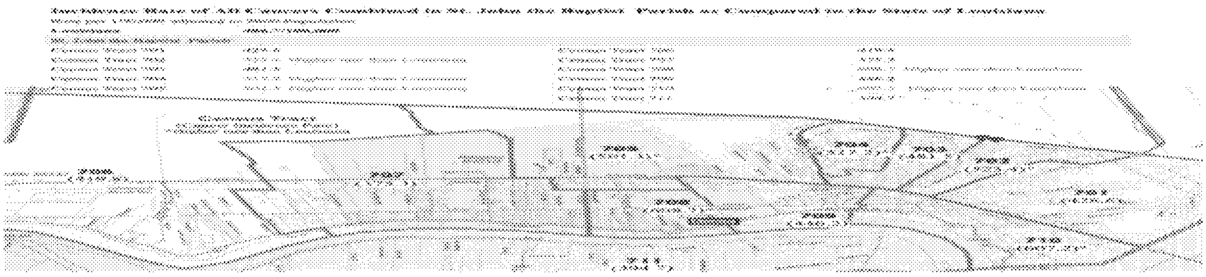
Cancer Incidence Rates by Census Tract in St John the Baptist Parish, 2006-2014



Cancer Incidence in Louisiana and St. John the Baptist Parish by Census Tract , 2006 - 2014

Louisiana Tumor Registry

March 2018

Compiled by Wilma Subra

Louisiana Environmental Action Network

April 8, 2018

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Both 125 % of rate in Louisiana

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Rate of All Cancers Combined

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776.8 per million and is 800 times the national average for cancer risks associated with Chloroprene (national average 0.968).

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Eight census tracts had reported rates of lung and bronchus cancers. The lung and bronchus cancers ranged from 49.0 per 100,000 for census tract 711 to 101.4 per 100,000 for census tract 710. Four of the census tracts had lung and bronchus rates over the state of Louisiana rate (73.7 per 100,000). The four census tracts were census tract 702 (73.9), 708 (84.7), 704 (89.0) and 710 (101.4).

Colon and Rectum Cancer

Seven census tracts had reported rates of colon and rectum cancer. The colon and rectum cancers ranged from 41.4 per 100,000 for census tract 703 to 84.8 per 100,000 for census tract 708. Six of the seven census tracts had colon and rectum cancer rates above the rate of colon and rectum cancers in the state of Louisiana (50.1). The six census tracts were census tract 702 (51.1), 705 (55.8), 707 (57.0), 710 (57.2), 706 (61.6) and 708 (84.8).

Female Breast Cancer

Four census tracts had reported rates for female breast cancer. The female breast cancers ranged from 115.2 per 100,000 for census tract 705 to 158.2 per 100,000 for census tract 704. Two of the four census tracts had female breast cancer rates above the state rate of 122.1 per 100,000. The census tracts were census tract 703 (145.3) and census tract 704 (158.2).

Prostate Cancer

Four census tracts had reported rates for prostate cancer. The prostate cancers ranged from 98.9 per 100,000 for census tract 707 to 272.0 per 100,000 for census tract 702. Two of the four census tracts had prostate cancer rates above the state rate of 158.0 per 100,000. The census tracts were census tract 703 (164.6) and census tract 702 (272.0).

Census Tract 708

Census tract 708 had the highest risk of cancer due to Chloroprene exposure in the entire United States. Based on the newly released data for cancers in Louisiana by census tract, census tract 708 had significantly higher cancer risk for all cancers (608.7 per 100,000) when compared to the state of Louisiana cancer rate (486.7).

Census tract 708 had over the Louisiana cancer rate (50.1 per 100,000) for colon and rectum cancer (84.8 per 100,000) and over the Louisiana cancer rate (73.7 per 100,000) for lung and bronchus (84.7 per 100,000).

The post Cancer Incidence Rates by Census Tract in St John the Baptist Parish, 2006-2014 appeared first on Louisiana Environmental Action Network.

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Message

From:	Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent:	8/21/2018 11:54:47 PM
To:	Bryan.shaw@tceq.texas.gov; Stephanie Bergeron Perdue [Stephanie.Bergeron_Perdue@tceq.texas.gov]; Andrea Morrow [Andrea.Morrow@tceq.texas.gov]; keogh@adeq.state.ar.us; Scott.Thompson@deq.ok.gov; butch.tongate@state.nm.us; Dougherty-Diffendorfer, Katy, NMENV [Katy.Dougherty-Diff@state.nm.us]; Chuck Brown [Chuck.Brown@LA.GOV]; Gregory Langley [Gregory.Langley@LA.GOV]; Davis, Donnally [davis@adeq.state.ar.us]; skylar.mcelhaney@deq.ok.gov
CC:	Idsal, Anne [idsal.anne@epa.gov]; Chancellor, Erin [chancellor.erin@epa.gov]
Subject:	NATA Data Materials
Attachments:	2014 NATA Overview Fact Sheet..pdf; Ethylene Oxide Fact Sheet.Final.8.21.18.pdf; Draft Desk Statement quick review.docx

We wanted to make certain that you had the latest information about the NATA data rollout tomorrow – Wednesday, August 22. Please do not distribute this information before EPA. The NATA website will go live tomorrow at 2 p.m. EST. EPA is not issuing a press release.

- Desk Statement (note: similar content as the Ethylene Oxide Fact Sheet)
- NATA Overview Fact Sheet (for public dissemination)
- Ethylene Oxide Fact Sheet (for public dissemination)

David

David Gray
Deputy Regional Administrator
USEPA – Dallas
gray.david@epa.gov
(214) 665-8120 direct
(214) 789-2619 cell
(214) 665-2100 general office

EPA Taking Steps to Address Emissions of Ethylene Oxide

Latest National Air Toxics Assessment Shows Potential Health Concerns in Some Areas

STATEMENT

AUGUST 22, 2018 -- The U.S. Environmental Protection Agency (EPA) is taking steps to address emissions of the chemical *ethylene oxide* from some types of industrial facilities across the country.

EPA is examining these emissions based on the results of the 2014 National Air Toxics Assessment (NATA), which EPA is releasing today. NATA has identified the chemical as a potential concern in several areas across the country. NATA is the agency's nationwide air toxics screening tool, designed to help EPA and state, local and tribal air agencies identify areas, pollutants or types of sources for further examination. NATA does not estimate any person's individual risk.

Based on an examination of available data, EPA does not expect ethylene oxide levels in the air to be high enough to cause immediate harm to health. However, the 2014 NATA shows number of areas could have elevated cancer risks from long-term (many years) ethylene oxide exposure. These potential risks are largely driven by an EPA risk value that was updated in late 2016.

EPA is taking a two-pronged approach to address ethylene oxide emissions:

- First, the agency will review its air toxics regulations for facilities that emit ethylene oxide. EPA has begun reviewing its air toxics emissions standards for miscellaneous organic chemical manufacturing facilities, some of which emit ethylene oxide. The agency also plans to take a closer look at its rules for other types of facilities, beginning with its emissions standards for commercial sterilizers.
- Second, EPA is gathering additional information on industrial emissions of ethylene oxide, which may include data from testing at some types of facilities. This information will help EPA as it looks for opportunities to reduce EtO emissions as part of its regulations review. It also will help the agency determine whether more immediate emission reduction steps are necessary in any particular locations.

EPA will post updates on its work to address ethylene oxide emissions at [HYPERLINK "https://www.epa.gov/ethylene-oxide"]

Background

The 2014 NATA estimates that EtO significantly contributes to potential elevated cancer risks in some census tracts across the U.S. (less than 1 percent of the total number of tracts).

The 2014 NATA uses emissions data from 2014 (the most recent data available), along with the latest scientific information on air toxics and health, to estimate air toxics exposures and potential public health risk in census tracts across the United States.

Ethylene oxide is used to sterilize equipment and plastic devices that can't be sterilized with steam, such as medical devices. It also is used to make other chemicals. One of those is ethylene glycol, which is used to make everyday products such as antifreeze, PVC plumbing pipe, vinyl flooring and plastics products, including recyclable plastic containers and bottles.

For more information on NATA, visit: [HYPERLINK "https://www.epa.gov/national-air-toxics-assessment"]

Message

From: Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent: 2/8/2018 3:58:58 PM
To: Chuck Brown [Chuck.Brown@LA.GOV]
Subject: Letter
Attachments: R6-18-000-3388 Guidry Denka Performance Elastomer.docx

Dr. Brown,
I wanted to give you a quick heads up regarding our response to Dr. Guidry. I anticipate the letter going out today.
David

David Gray
Deputy Regional Administrator (acting)
EPA Region 6 – Dallas
(214) 665-2100 office
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gray.david@epa.gov

[EMBED MSPhotoEd.3]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TEXAS 75202 – 2733

Office of the Regional Administrator

Jimmy Guidry, M.D.
State Health Officer and Medical Director
Louisiana Department of Health and Hospitals
Post Office Box 629
Baton Rouge, Louisiana 70821-0629

Dear Dr. Guidry:

Thank you for your letter of December 4, 2017, to the United States Environmental Protection Agency regarding the EPA Action Plan for the Denka Performance Elastomer LLC - Pontchartrain Facility (DPE) in LaPlace, Louisiana. This action plan, dated June 2016, was written to provide a point-in-time communication strategy for presenting information to the community. While the EPA's action plan is a compilation of information used by the Agency to inform decisions, it does not identify actual exposure and associated risks to specific individuals.

Within the action plan, the EPA provided a brief explanation of our National Air Toxics Assessment (NATA), the EPA's comprehensive evaluation of air toxics in the United States, based on modeled air quality. The results of the NATA provide estimates of the total amount of air toxics in an area as well as a general estimate of the geographic patterns of potential risk within the community. The results should not be used to measure whether an individual's risk is high, but may be used to guide a more specific assessment in that area. In this case, the results from the NATA led to the community monitoring of ambient chloroprene concentrations that the EPA and Louisiana Department of Environmental Quality have undertaken for the past few years. These activities are not reflected in the 2016 Action Plan.

As I stated in my January 25, 2018, letter to Secretary Brown, we appreciate the efforts that the Louisiana Department of Environmental Quality has extended to DPE to reduce the emissions from the LaPlace facility. The completion of four major construction projects to control the chloroprene emissions within 12 months was brought about with LDEQ's guidance under its Agreed Order on Consent issued to DPE. We look forward to seeing the results of lowered emissions in the ambient air this year and understand from Denka that the final work is being completed. We will continue to collect ambient air samples in the community and re-assess conditions after several months of improved operations.

Should you have any further questions, please contact me at (214) 665-2100, or your staff may contact Ms. Carmen Assunto, State and Local Government Liaison, at (214) 665-2200.

Sincerely,

Anne L. Idsal
Regional Administrator

Message

From: Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent: 2/7/2018 7:15:22 PM
To: Gregory Langley [Gregory.Langley@LA.GOV]
Subject: Letter
Attachments: R6-18-000-3388 Guidry Denka Performance Elastomer.docx

Greg,
Would you show this letter to Dr. Brown? I'd be interested in any feedback.
David

Message

From: Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent: 9/21/2017 6:40:22 PM
To: Gregory Langley [Gregory.Langley@LA.GOV]
Subject: Draft
Attachments: Att 1 R6 Summary through June 28 2017.pdf; Att 2 Graphs Charts.pdf; Att 3 Denka Fact Sheet.pdf; Denka Interim Data Update Report FINAL DRAFT 090617 wo attchmnt.docx

Greg,

Here is our draft report for monitoring results. I wanted to share it with you and invite your groups comments/suggestions. Also, please feel free to share with Parish if you think that is helpful.

David

DENKA Air Monitoring Summary Sheet
May 25, 2016 - June 28, 2017
(All units are µg/m3)

DATE	Ochsner Hospital	Acorn and Hwy 44	Levee	Fifth Ward Elementary School	238 Chad Baker	East St. John the Baptist High School
05/25/16	ND	1.29	ND	ND	ND	0.831
05/25/16 (collocated)	--	--	--	ND	--	--
05/28/16	--	Invalid	Invalid	--	--	Invalid
05/28/16 (collocated)	--	--	--	--	--	Invalid
05/31/16	17.5	30.3	6.13	3.07	7.58	2.02
05/31/16 (collocated)	--	--	--	--	--	--
06/02/16	0.083	0.073	2.64	1.88	7.15	2.67
06/02/16 (collocated)	0.047	--	--	--	--	--
06/05/16	0.809	ND	20.5	4.97	11.1	0.341
06/05/16 (collocated)	--	ND	--	--	--	--
06/09/16	4.68	0.624	4.93	3.41	5.48	1.25
06/09/16 (collocated)	--	--	4.72	--	--	--
06/12/16	1.28	0.983	0.272	0.573	5.37	5.15
06/12/16 (collocated)	--	--	--	--	--	5.73
06/15/16	10.8	0.225	0.366	1.74	1.21	1.07
06/15/16 (collocated)	--	--	--	--	--	0.990
06/18/16	2.98	4.39	2.70	1.89	7.87	0.268
06/18/16 (collocated)	--	4.21	--	--	--	--
06/21/16	0.686	ND	0.413	1.30	5.08	1.04
06/21/16 (collocated)	--	--	--	1.49	--	--
06/24/16	7.54	6.82	0.319	ND	0.305	*0.029*
06/24/16 (collocated)	--	--	0.540	--	--	--
06/27/16	1.61	1.19	0.040	ND	0.163	0.417
06/27/16 (collocated)	--	1.19	--	--	--	--
06/30/16	ND	ND	7.15	3.50	4.53	0.352
06/30/16 (collocated)	--	--	--	--	4.21	--
07/03/16	4.28	0.054	ND	ND	ND	1.69
07/03/16 (collocated)	--	--	--	--	--	--
07/06/16	9.61	ND	ND	ND	ND	0.120
07/06/16 (collocated)	--	--	--	--	--	--
07/09/16	6.02	4.75	1.88	0.345	1.71	0.762
07/09/16 (collocated)	6.64	--	--	--	--	--

DENKA Air Monitoring Summary Sheet
May 25, 2016 - June 28, 2017
(All units are µg/m3)

DATE	Ochsner Hospital	Acorn and Hwy 44	Levee	Fifth Ward Elementary School	238 Chad Baker	East St. John the Baptist High School
07/12/16	0.232	1.23	0.722	5.62	6.89	2.36
07/12/16 (collocated)	--	--	--	--	--	2.70
07/15/16	1.53	0.881	6.46	3.63	12.4	0.914
07/15/16 (collocated)	1.73	--	--	--	--	--
07/18/16	ND	ND	1.70	44.3	37.0	0.276
07/18/16 (collocated)	--	--	--	--	33.2	--
07/21/16	1.06	1.18	4.90	11.3	5.01	2.12
07/21/16 (collocated)	--	--	--	11.3	--	--
07/24/16	10.0	9.07	9.47	8.09	16.7	8.16
07/24/16 (collocated)	--	--	10.0	--	--	--
07/27/16	3.59	1.71	ND	ND	ND	0.196
07/27/16 (collocated)	3.70	--	--	--	--	--
07/30/16	11.2	5.30	6.35	3.15	2.49	2.67
07/30/16 (collocated)	10.8	--	--	--	--	--
08/02/16	6.56	0.881	16.8	10.3	0.254	1.86
08/02/16 (collocated)	5.95	--	--	--	--	--
08/05/16	5.48	12.5	21.4	8.67	5.84	2.39
08/05/16 (collocated)	--	12.7	--	--	--	--
08/08/16	0.827	4.86	2.77	0.569	0.417	1.63
08/08/16 (collocated)	--	5.98	--	--	--	--
08/11/16	2.43	12.8	0.649	ND	ND	ND
08/11/16 (collocated)	2.23	--	--	--	--	--
08/14/16	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
08/14/16 (collocated)	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
08/17/16	No Samples Collected Due to Flooding in the Area					
08/17/16 (collocated)	No Samples Collected Due to Flooding in the Area					
08/20/16	No Samples Collected Due to Flooding in the Area					
08/20/16 (collocated)	No Samples Collected Due to Flooding in the Area					
08/23/16	24.0	34.7	--	--	5.19	8.56
08/23/16 (collocated)	23.0	--	--	--	--	--
08/26/16	1.37	0.468	2.23	6.06	1.61	0.301
08/26/16 (collocated)	--	--	--	--	1.65	--

DENKA Air Monitoring Summary Sheet
May 25, 2016 - June 28, 2017
(All units are µg/m3)

DATE	Ochsner Hospital	Acorn and Hwy 44	Levee	Fifth Ward Elementary School	238 Chad Baker	East St. John the Baptist High School
08/29/16	ND	ND	0.073	38.4	25.6	0.627
08/29/16 (collocated)	--	--	--	38.8	--	--
09/01/16	ND	ND	8.09	13.1	0.798	ND
09/01/16 (collocated)	--	--	--	11.0	--	--
09/04/16	7.65	39.2	74.7	34.7	31.0	10.2
09/04/16 (collocated)	--	--	--	--	30.7	--
09/07/16	1.17	2.21	2.14	3.44	Invalid	2.17
09/07/16 (collocated)	--	--	--	--	33.8	--
09/10/16	0.791	0.160	2.53	6.27	10.9	4.90
09/10/16 (collocated)	--	--	--	--	10.7	--
09/13/16	ND	ND	0.232	16.1	46.1	0.120
09/13/16 (collocated)	--	--	--	--	44.3	--
09/16/16	ND	ND	ND	0.693	28.6	0.921
09/16/16 (collocated)	--	--	--	--	24.7	--
09/19/16	0.076	0.105	1.320	ND	ND	0.033
09/19/16 (collocated)	0.062	--	--	--	--	--
09/22/16	ND	ND	0.18	0.722	0.363	0.065
09/22/16 (collocated)	--	--	--	0.664	--	--
09/25/16	ND	0.073	0.548	0.105	0.109	0.127
09/25/16 (collocated)	--	--	--	--	0.138	--
09/28/16	0.301	0.432	3.37	0.555	0.073	0.051
09/28/16 (collocated)	--	--	3.49	--	--	--
10/01/16	ND	ND	10.3	ND	0.051	ND
10/01/16 (collocated)	--	--	10.6	--	--	--
10/04/16	6.06	1.27	26.8	42.4	37.4	24.9
10/04/16 (collocated)	--	--	--	33.3	--	--
10/07/16	0.704	0.403	4.24	5.77	32.8	1.37
10/07/16 (collocated)	--	--	--	5.73		--
10/10/16	ND	ND	8.74	12.5	8.49	ND
10/10/16 (collocated)	--	--	--	12.6	--	--
10/13/16	0.258	ND	1.27	1.76	18.8	3.57
10/13/16 (collocated)	--	--	--	1.7	--	--

DENKA Air Monitoring Summary Sheet
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DATE	Ochsner Hospital	Acorn and Hwy 44	Levee	Fifth Ward Elementary School	238 Chad Baker	East St. John the Baptist High School
10/16/16	ND	ND	3.33	25.6	32.3	ND
10/16/16 (collocated)	--	--	--	--	31.6	--
10/19/16	ND	ND	ND	0.232	12.1	1.70
10/19/16 (collocated)	--	--	--	--	11.9	--
10/22/16	0.073	ND	13.5	ND	0.410	ND
10/22/16 (collocated)	--	--	9,.68	--	--	--
10/25/16	43.5	57.3	67.5	33.0	29.8	12.0
10/25/16 (collocated)	--	--	65.3	--	--	--
10/28/16	ND	ND	11.9	11.1	25.0	0.07
10/28/16 (collocated)	--	--	--	11.9	--	--
10/31/16	27.5	17.5	29.6	1.96	5.04	16.2
10/31/16 (collocated)	--	--	--	1.99	--	--
11/03/16	ND	ND	2.30	66.4	18.8	ND
11/03/16 (collocated)	--	--	--	--	18.9	--
11/06/16	0.120	0.54	3.12	28.9	32.6	0.102
11/06/16 (collocated)	--	--	--	--	35.1	--
11/09/16	ND	ND	ND	16.4	0.921	ND
11/09/16 (collocated)	--	--	--	17.3	--	--
11/12/16	ND	ND	ND	2.22	0.221	15.1
11/12/16 (collocated)	--	--	--	2.13	--	--
11/15/16	59.8	106	54.8	ND	ND	0.268
11/15/16 (collocated)	--	--	--	ND	--	--
11/18/16	0.831	0.827	0.210	23.4	16.9	3.61
11/18/16 (collocated)	--	--	--	--	--	3.40
11/21/16	66.7	153	147	1.60	8.27	0.388
11/21/16 (collocated)	--	--	--	1.61	--	--
11/24/16	3.77	5.66	17.1	1.02	2.81	0.870
11/24/16 (collocated)	3.74	--	--	--	--	--
11/27/16	*0.018*	*0.025*	4.90	5.40	3.74	ND
11/27/16 (collocated)	--	--	--	5.08	--	--
11/30/16	0.218	*0.025*	0.802	*0.025*	*0.018*	0.058
11/30/16 (collocated)	--	--	--	--	--	0.062

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DATE	Ochsner Hospital	Acorn and Hwy 44	Levee	Fifth Ward Elementary School	238 Chad Baker	East St. John the Baptist High School
12/03/16	ND	0.044	ND	0.979	40.6	ND
12/03/16 (collocated)	--	--	--	--	41.0	
12/06/16	0.787	3.41	*0.029*	0.635	2.42	0.413
12/06/16 (collocated)	--	3.55	--	--	--	--
12/09/16	ND	ND	0.537	0.433	ND	ND
12/09/16 (collocated)	--	--	--	0.450	--	--
12/12/16	2.44	0.196	0.381	ND	ND	2.41
12/12/16 (collocated)	--	--	--	--	--	2.36
12/15/16	ND	ND	21.3	*0.025*	ND	ND
12/15/16 (collocated)	--	--		*0.029*	--	--
12/18/16	2.22	ND	8.81	ND	ND	ND
12/18/16 (collocated)	--	--	--	--	--	ND
12/21/16	3.21	1.71	17.4	37.4	40.3	0.889
12/21/16 (collocated)	--	--	--	39.9	--	--
12/24/16	ND	ND	10.6	20.9	26.2	0.820
12/24/16 (collocated)	--	--	--	--	25.5	--
12/27/16	0.232	0.649	0.812	16.7	17.1	1.11
12/27/16 (collocated)	--	--	--	--	16.2	--
12/30/16	ND	ND	17.6	4.82	3.18	ND
12/30/16 (collocated)	--	--	Invalid	--	--	--
01/02/17	2.76	3.06	ND	0.664	19.5	2.93
01/02/17 (collocated)	2.88	--	--	--	--	--
01/05/17	ND	ND	4.68	17.5	33.2	0.577
01/05/17 (collocated)	--	--	--	Invalid	--	--
01/08/17	ND	ND	Invalid	1.81	1.28	ND
01/08/17 (collocated)	--	--	Invalid	--	--	--
01/11/17	0.083	ND	0.029	0.033	ND	20.3
01/11/17 (collocated)	--	--	--	--	--	20.5
01/14/17	ND	ND	0.381	75.1	20.0	ND
01/14/17 (collocated)	--	--	--	75.1	--	--
01/17/17	0.522	0.036	0.036	ND	ND	11.0
01/17/17 (collocated)	--	--	--	--	--	10.7

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DATE	Ochsner Hospital	Acorn and Hwy 44	Levee	Fifth Ward Elementary School	238 Chad Baker	East St. John the Baptist High School
01/20/17	1.78	7.76	ND	ND	ND	0.145
01/20/17 (collocated)	1.99	--	--	--	--	--
01/23/17	0.022	6.09	ND	ND	ND	ND
01/23/17 (collocated)	--	6.13	--	--	--	--
01/26/17	0.297	ND	0.939	ND	ND	ND
01/26/17 (collocated)	0.297	--	--	--	--	--
01/29/17	ND	0.352	ND	ND	ND	ND
01/29/17 (collocated)	--	0.352	--	--	--	--
02/01/17	0.051	ND	ND	ND	ND	0.051
02/01/17 (collocated)	0.054	--	--	--	--	--
02/04/17	ND	ND	0.203	0.141	0.058	ND
02/04/17 (collocated)	--	--	--	0.174	--	--
02/07/17	0.051	ND	ND	ND	ND	0.087
02/07/17 (collocated)	--	--	--	--	--	0.087
02/10/17	ND	ND	9.68	1.15	1.32	0.022
02/10/17 (collocated)	--	--	--	--	1.40	--
02/13/17	0.040	14.2	0.656	8.56	0.316	ND
02/13/17 (collocated)	--	--	--	8.92	--	--
02/16/17	ND	2.69	2.62	0.218	0.073	ND
02/16/17 (collocated)	--	2.13	--	--	--	--
02/19/17	0.112	0.301	0.334	1.740	0.551	0.682
02/19/17 (collocated)	--	--	--	--	0.805	--
02/22/17	0.160	1.96	3.060	0.091	0.109	0.047
02/22/17 (collocated)	--	1.90	--	--	--	--
02/25/17	11.10	0.939	35.80	ND	ND	ND
02/25/17 (collocated)	--	0.856	--	--	--	--
02/28/17	1.27	0.265	ND	ND	ND	7.76
02/28/17 (collocated)	--	--	--	--	--	8.16
03/03/17	ND	ND	2.25	1.36	2.58	ND
03/03/17 (collocated)	--	--	--	1.55	--	--
03/06/17	ND	ND	ND	ND	ND	0.620
03/06/17 (collocated)	--	--	--	--	--	--

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03/09/17	0.047	ND	0.112	3.15	14.8	1.44
03/09/17 (collocated)	--	--	--	--	15.5	--
03/12/17	ND	ND	0.279	11.9	5.6	0.076
03/12/17 (collocated)	--	--	--	--	5.3	--
03/15/17	*0.025*	*0.04*	2.250	2.44	0.497	*0.025*
03/15/17 (collocated)	--	--	2.31	--	--	--
03/18/17	0.562	0.25	*0.022*	*0.022*	0.152	2.21
03/18/17 (collocated)	--	--	--	--	--	2.66
03/21/17	13.30	2.84	*0.022*	*0.025*	ND	ND
03/21/17 (collocated)	--	Invalid	--	--	--	--
03/24/17	*0.025*	*0.029*	*0.025*	ND	*0.062*	0.178
03/24/17 (collocated)	--	--	--	--	0.116	--
03/27/17	*0.033*	*0.022*	*0.022*	ND	ND	4.86
03/27/17 (collocated)	--	--	--	--	--	4.72
03/30/17	2.67	0.881	0.406	0.283	2.67	2.66
03/30/17 (collocated)	--	--	--	--	--	2.68
04/02/17	ND	ND	ND	0.044	4.90	ND
04/02/17 (collocated)	--	--	--	--	5.080	--
04/05/17	3.74	0.729	ND	ND	0.334	0.210
04/05/17 (collocated)	--	--	--	--	--	0.174
04/08/17	1.05	0.925	28.3	13.7	17.3	3.20
04/08/17 (collocated)	--	--	--	--	--	--
04/11/17	0.036	*0.029*		3.84	8.96	0.294
04/11/17 (collocated)	--	--	--	--	9.10	--
04/14/17	0.218	ND	12.5	51.1	24.6	1.35
04/14/17 (collocated)	--	--	--	--	32.0	--
04/17/17	0.276	*0.029*	0.120	17.6	18.4	1.53
04/17/17 (collocated)	--	--	--	--	Invalid	--
04/20/17	0.109	ND	0.319	7.620	8.270	0.381
04/20/17 (collocated)	--	--	--	--	8.960	--
04/23/17	0.232	0.816	10.6	0.051	0.765	0.102
04/23/17 (collocated)	--	0.943	--	--	--	--

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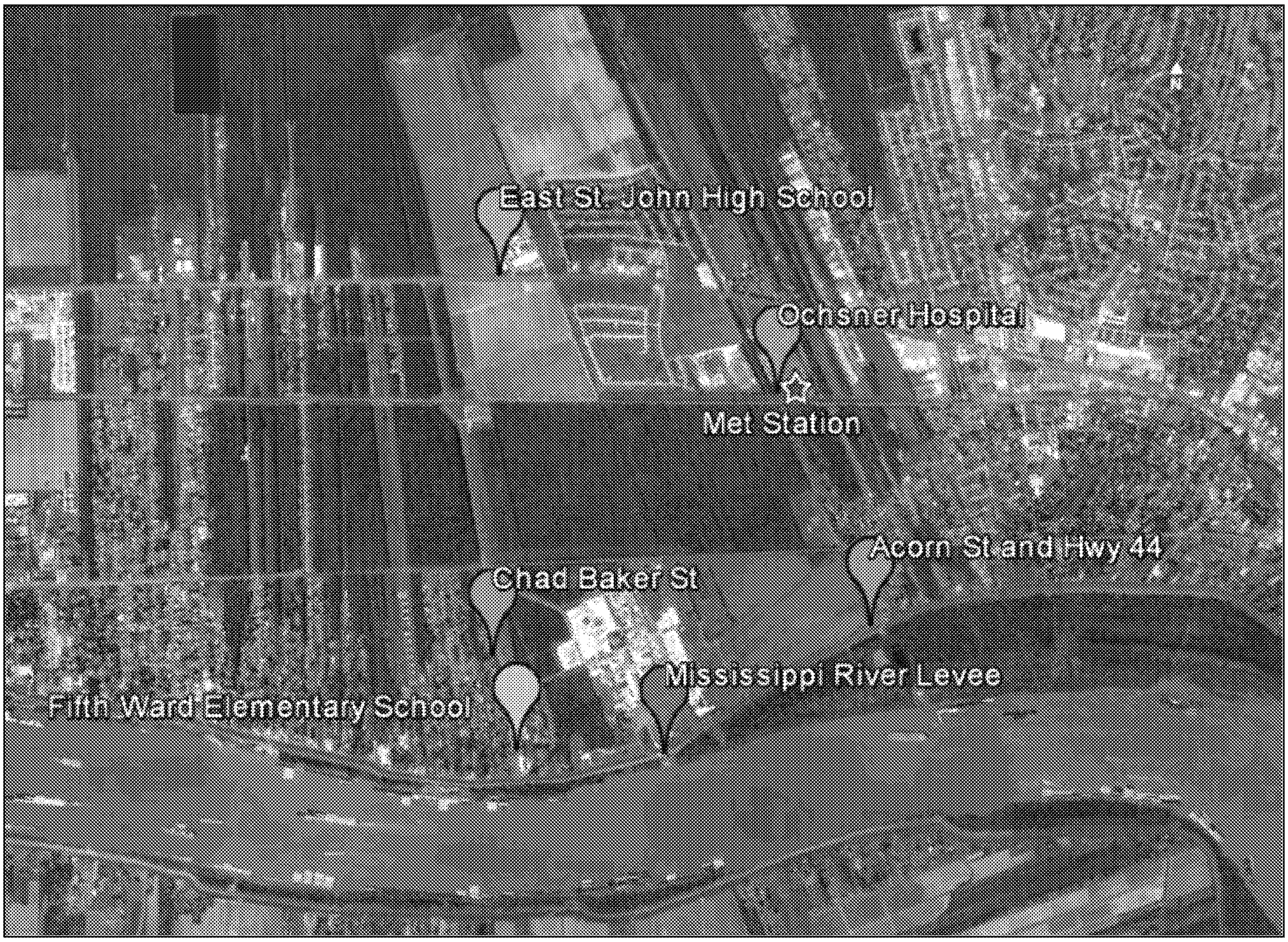
DATE	Ochsner Hospital	Acorn and Hwy 44	Levee	Fifth Ward Elementary School	238 Chad Baker	East St. John the Baptist High School
04/26/17	2.390	0.029	0.029	0.054	0.025	Invalid
04/26/17 (collocated)	--	--	--	--	--	7.58
04/29/17	0.029	0.029	0.033	0.033	0.044	2.19
04/29/17 (collocated)	--	--	--	--	--	2.30
05/02/17	17.6	11.5	9.90	4.64	9.94	6.60
05/02/17 (collocated)	17.6	--	--	--	--	--
05/05/17	0.312	2.81	0.174	ND	ND	ND
05/05/17 (collocated)	--	--	0.134	--	--	--
05/08/17	14.9	11.0	9.68	0.323	0.508	0.297
05/08/17 (collocated)	--	--	--	0.283	--	--
05/11/17	0.247	0.254	*0.022*	ND	0.729	2.250
05/11/17 (collocated)	--	--	--	--	--	2.540
05/14/17	ND	ND	1.22	ND	ND	ND
05/14/17 (collocated)	--	--	1.22	--	--	--
05/17/17	ND	ND	ND	ND	ND	0.109
05/17/17 (collocated)	--	--	--	--	--	0.094
05/20/17	*0.018*	ND	ND	ND	ND	*0.025*
05/20/17 (collocated)	--	--	--	--	--	ND
05/23/17	0.062	0.062	ND	ND	0.098	ND
05/23/17 (collocated)	--	--	--	--	--	ND
05/26/17	0.163	ND	ND	ND	ND	0.054
05/26/17 (collocated)	--	--	--	--	--	0.051
05/29/17	0.725	0.134	1.48	0.323	0.395	0.323
05/29/17 (collocated)	--	--	--	--	--	0.316
06/01/17	0.102	0.214	0.366	2.06	7.73	0.109
06/01/17 (collocated)	--	--	--	--	7.94	--
06/04/17	0.751	0.943	0.479	0.116	2.57	2.56
06/04/17 (collocated)	--	--	--	--	--	2.63
06/07/17	ND	ND	5.590	1.180	0.872	ND
06/07/17 (collocated)	--	--	--	1.180	--	--
06/10/17	ND	ND	ND	6.270	19.7	0.91
06/10/17 (collocated)	--	--	--	--	21.9	--

DENKA Air Monitoring Summary Sheet
May 25, 2016 - June 28, 2017
(All units are µg/m3)

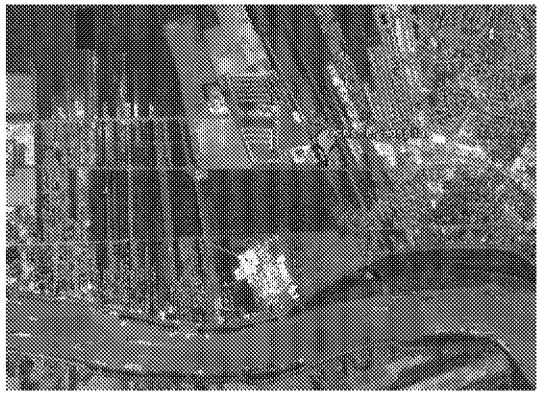
DATE	Ochsner Hospital	Acorn and Hwy 44	Levee	Fifth Ward Elementary School	238 Chad Baker	East St. John the Baptist High School
06/13/17	0.758	ND	ND	0.823	28.6	1.59
06/13/17 (collocated)	--	--	--	--	28.8	--
06/16/17	35.9	4.82	ND	ND	ND	ND
06/16/17 (collocated)	36.2	--	--	--	--	--
06/19/17	2.47	2.59	7.76	10.7	26.7	1.60
06/19/17 (collocated)	--	--	--	--	--	1.65
06/22/17	ND	ND	ND	ND	0.160	4.43
06/22/17 (collocated)	--	--	--	--	0.192	--
06/25/17	0.384	7.15	13.9	11.8	11.8	0.61
06/25/17 (collocated)	--	7.54	--	--	--	--
06/28/17	ND	ND	0.199	6.60	45.7	2.14
06/28/17 (collocated)	--	--	--	--	47.9	--

NOTES	EXPLANATION
---	No samples received in lab
Invalid	Sample was invalid
ND	Concentration not detected
Italicized	Concentration detected below method detection limit
Method detection limit	0.036 $\mu g/m^3$

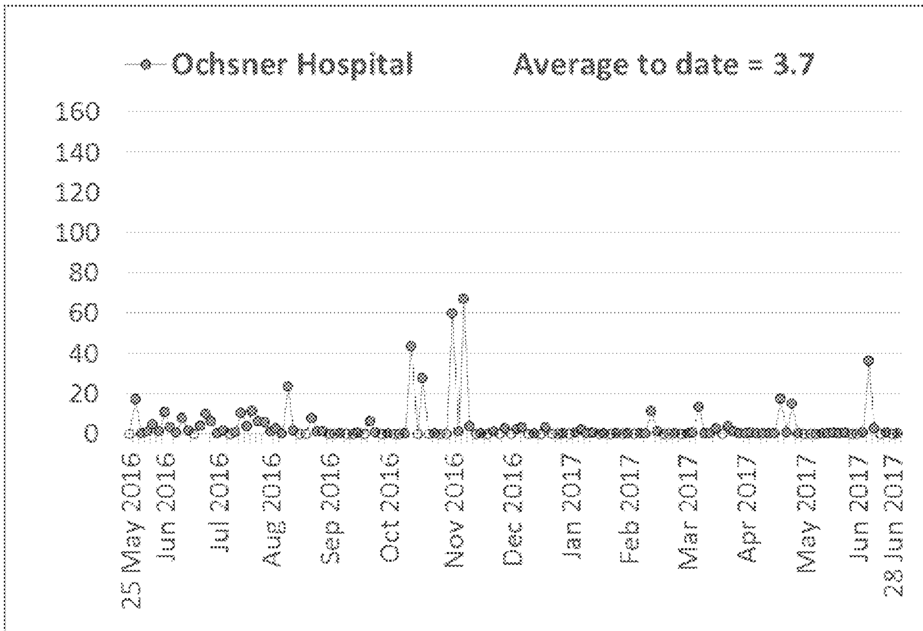
EPA monitoring locations



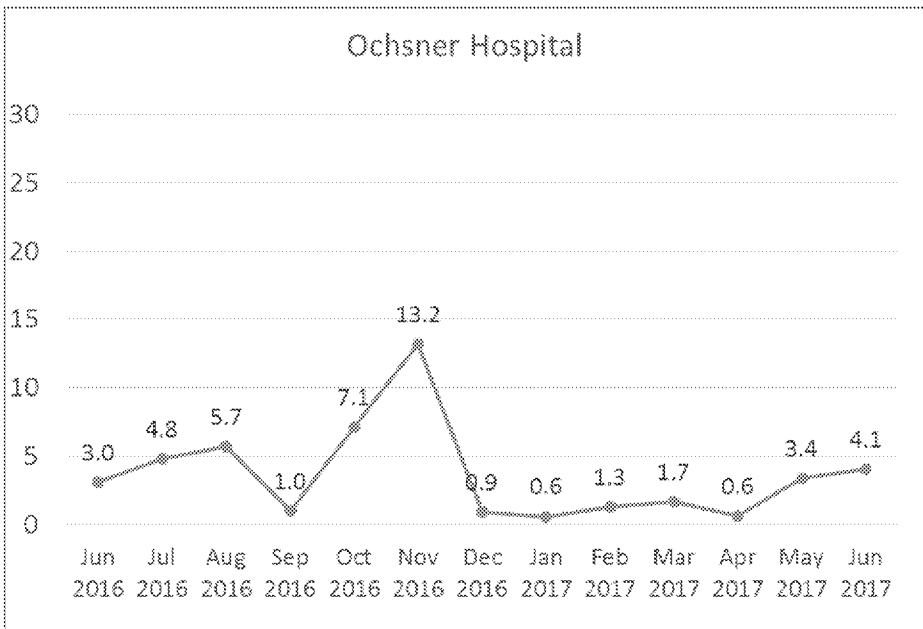
Ambient Chloroprene Concentrations ($\mu g/m^3$) at Ochsner Hospital



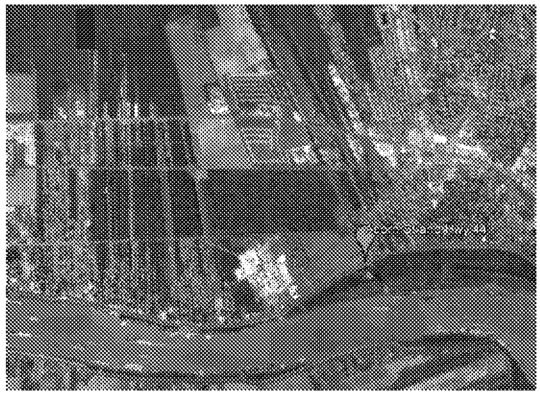
24-hour Chloroprene Concentrations



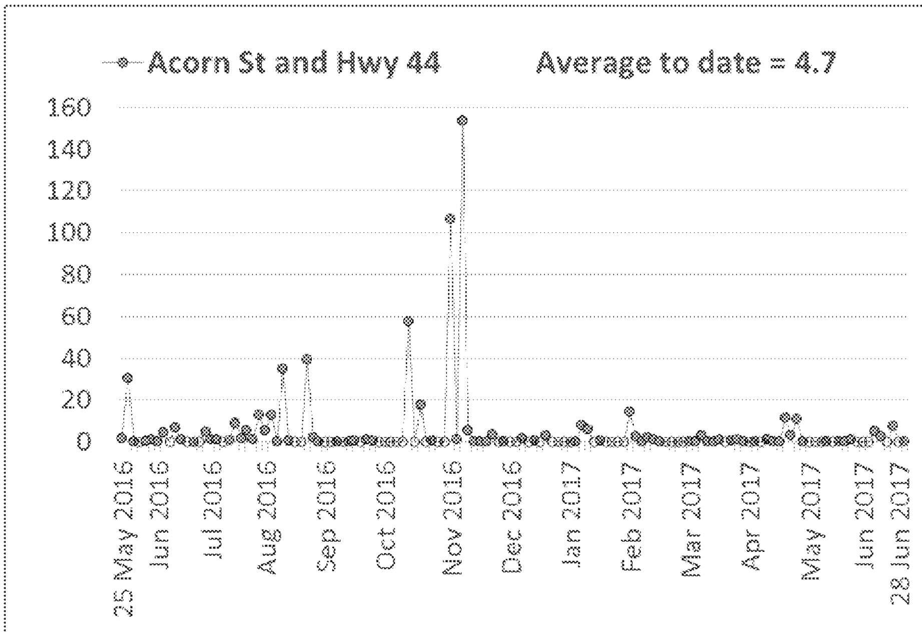
Monthly averages



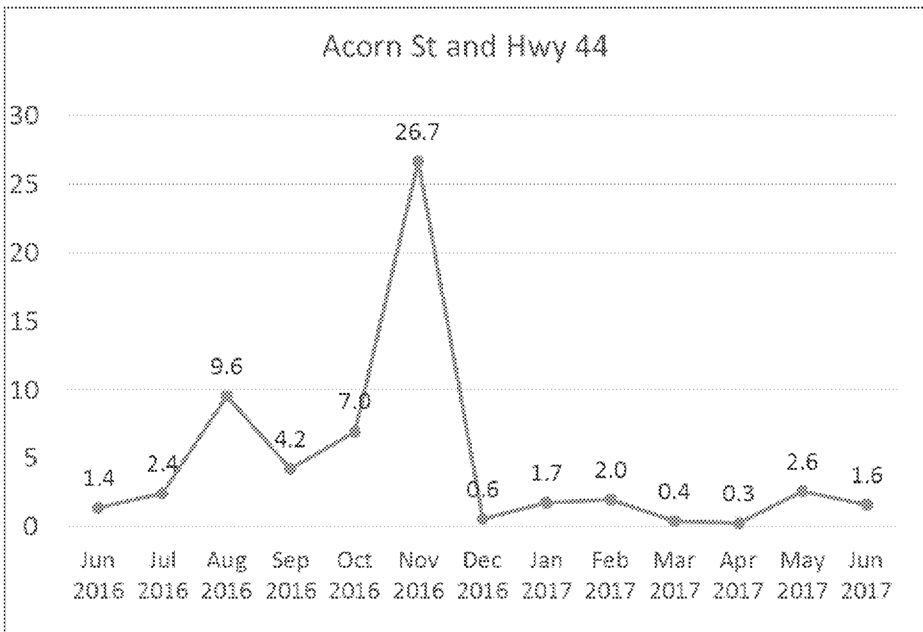
Ambient Chloroprene Concentrations (μg/m³) at Acorn St and Hwy 44



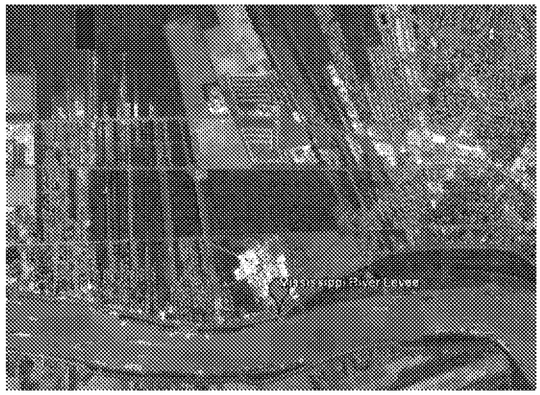
24-hour Chloroprene Concentrations



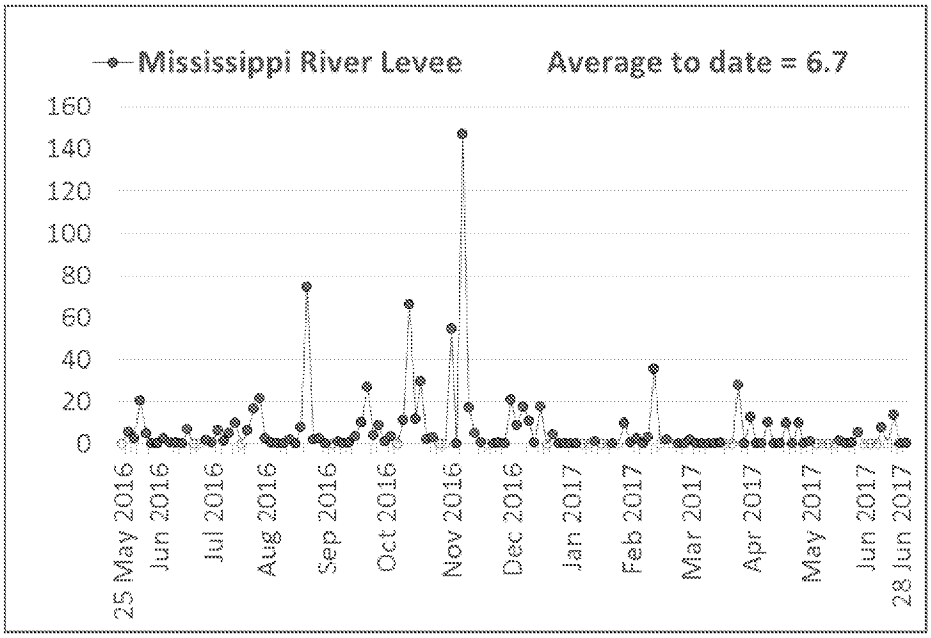
Monthly averages



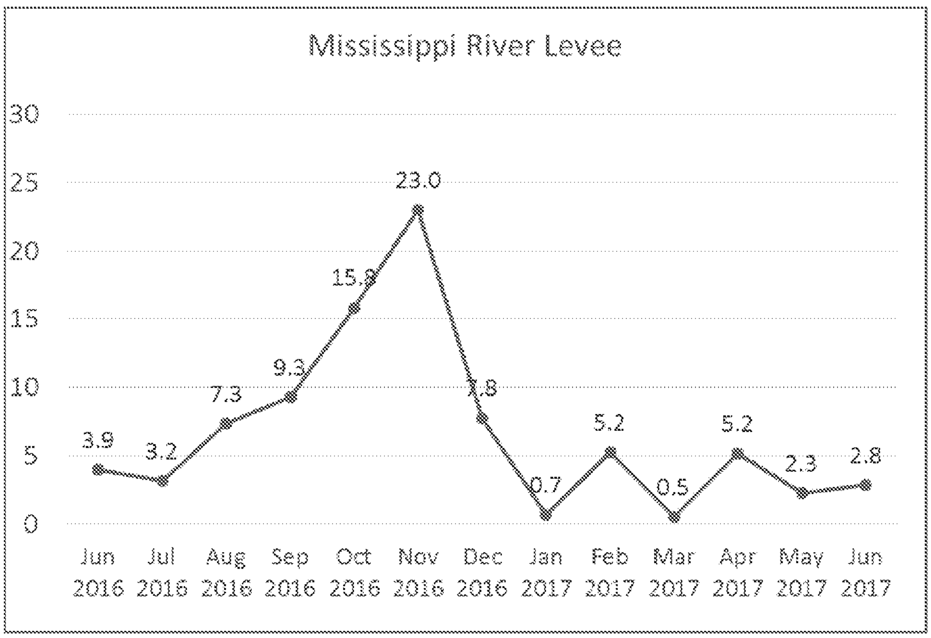
Ambient Chloroprene Concentrations ($\mu g/m^3$) at Mississippi River Levee



24-hour Chloroprene Concentrations

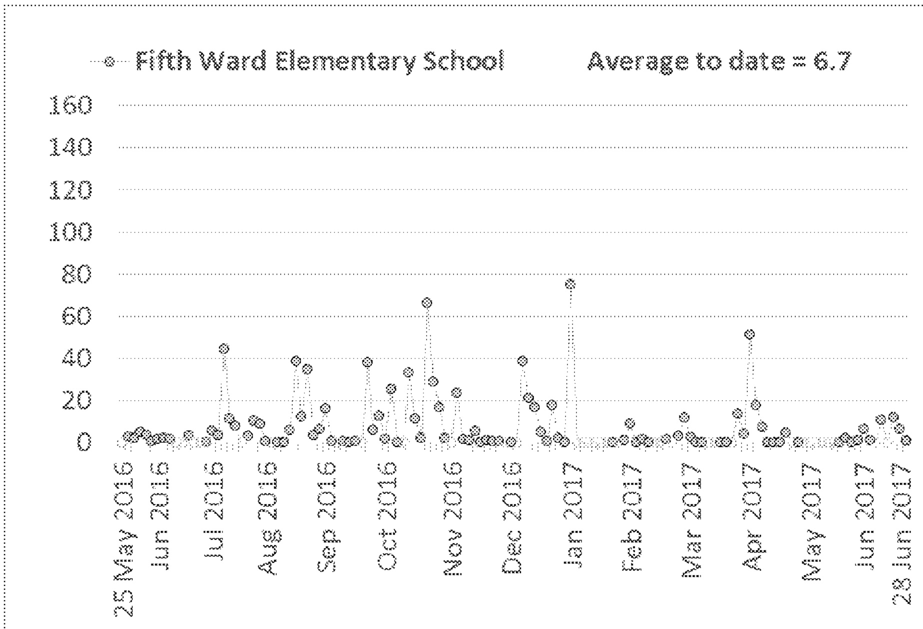


Monthly averages

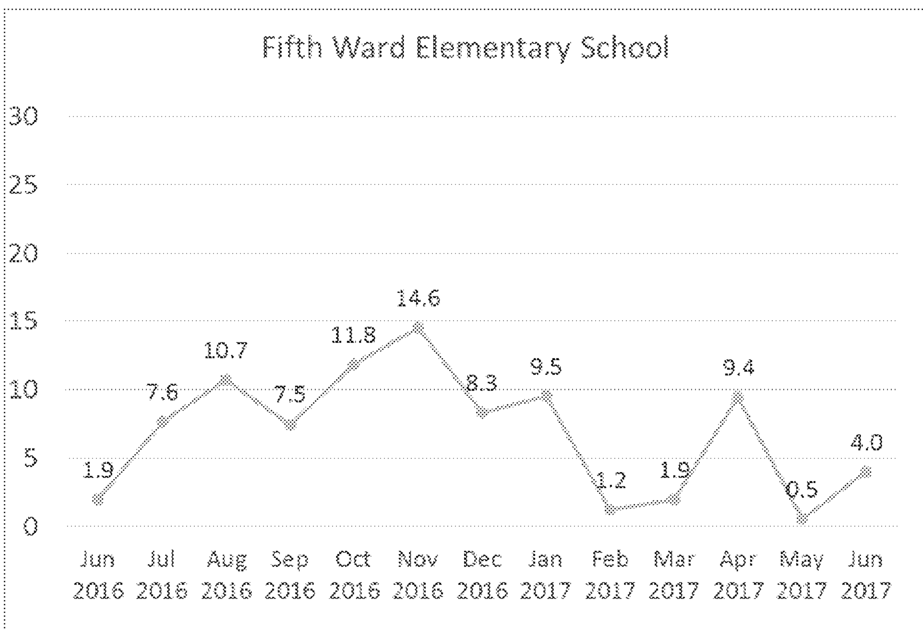


Ambient Chloroprene Concentrations ($\mu g/m^3$) at Fifth Ward Elementary School

24-hour Chloroprene Concentrations

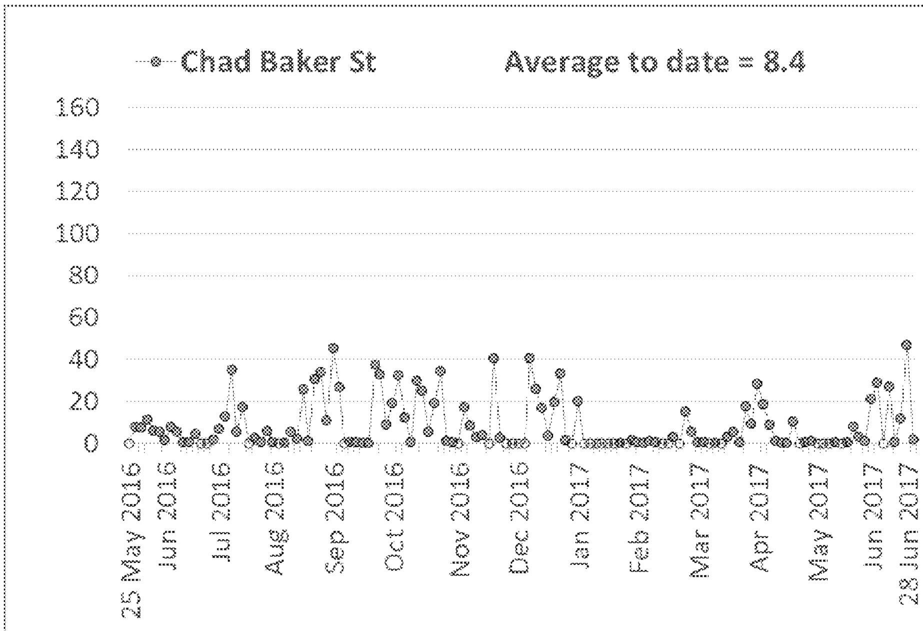


Monthly averages

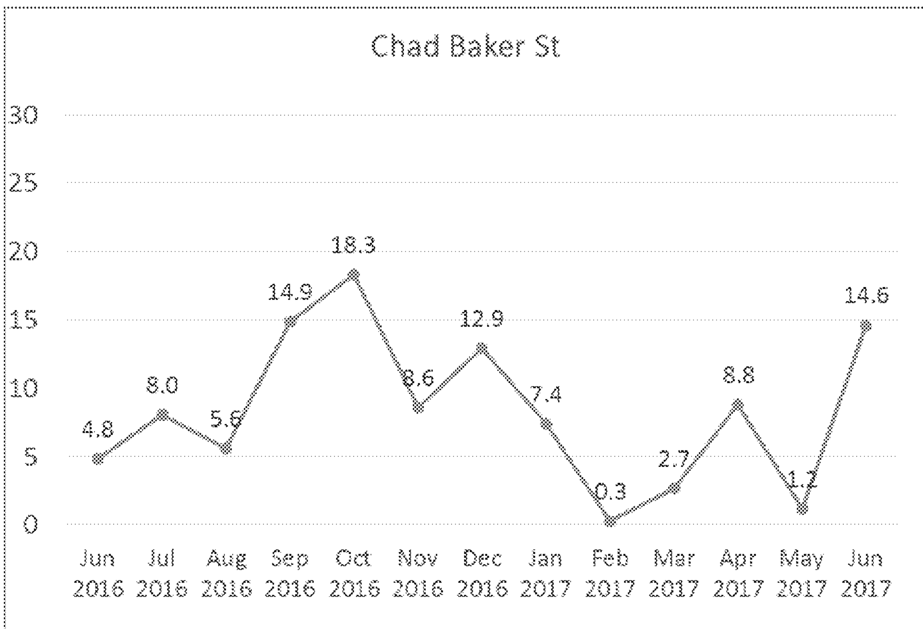


Ambient Chloroprene Concentrations (µg/m^3) at Chad Baker St

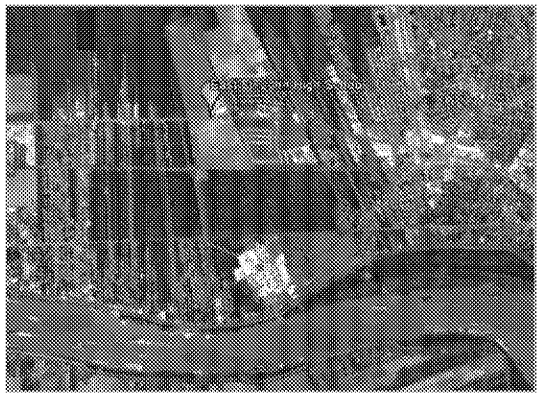
24-hour Chloroprene Concentrations



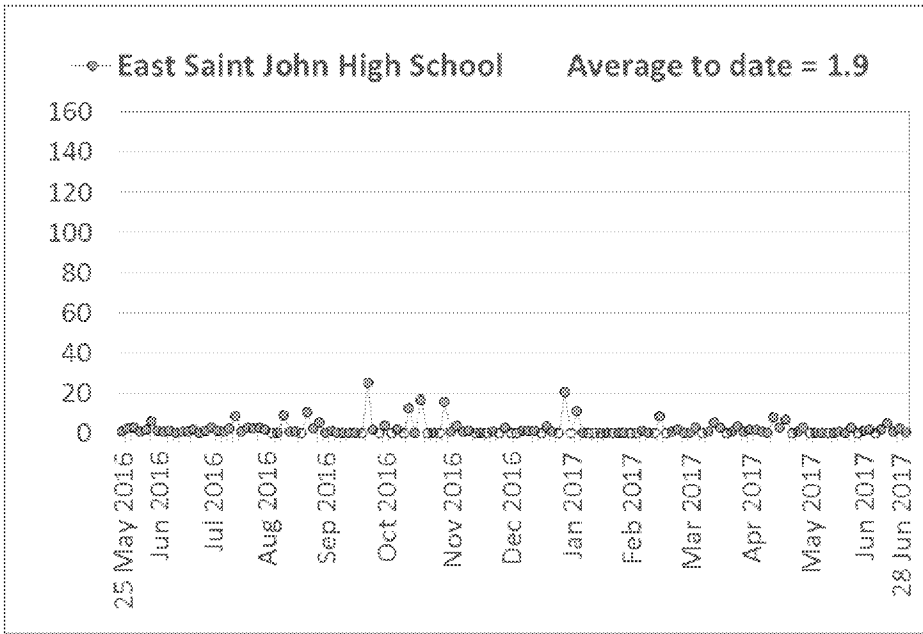
Monthly averages



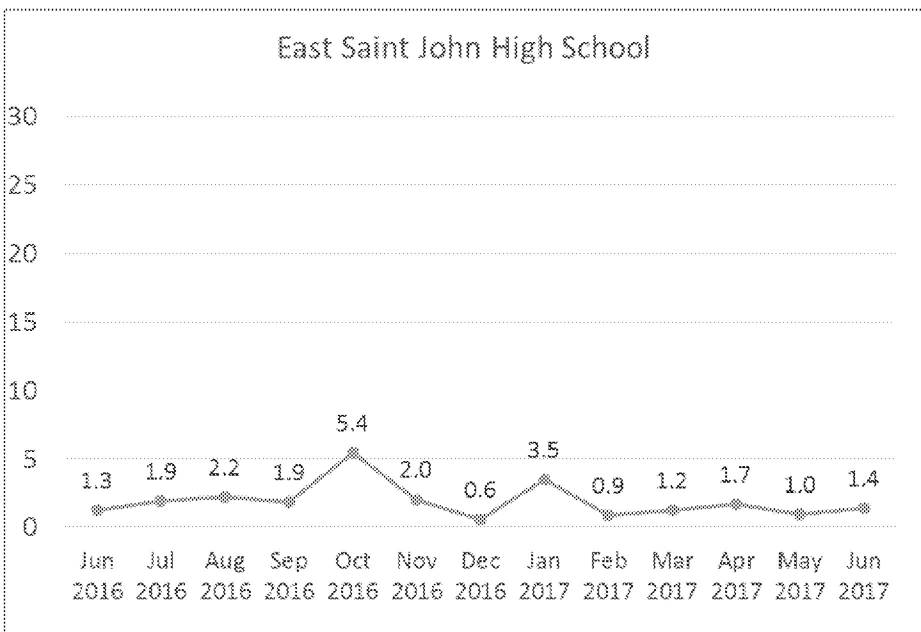
Ambient Chloroprene Concentrations ($\mu g/m^3$) at East St. John High School



24-hour Chloroprene Concentrations



Monthly averages



DENKA: THE PATH FORWARD

Denka, formerly DuPont, manufactures the chemical chloroprene to make neoprene synthetic rubber. The U.S. Environmental Protection Agency (EPA) reclassified chloroprene as a likely carcinogen in 2010. That reclassification was reflected in the National Air Toxics Assessment (NATA) map released by EPA in December 2015. The map showed an elevated risk for cancer in the area around the Denka plant in LaPlace, La. An elevated risk of cancer means that people have an increased chance of developing cancer because of continuous inhalation exposure to chloroprene **over a lifetime**.

What is the NATA's purpose?

The purpose of NATA is to identify and prioritize air toxics, emission source types and locations that are of greatest potential concern in terms of contributing to population risk. NATA uses estimates of emissions from the facility and the EPA computer models to measure concentrations of chloroprene in the air and the potential population health risks; it is not designed to determine actual health risks to individual people. EPA uses the results of these assessments in many ways, including to:

- Work with communities in designing their own local-scale assessments,To set priorities for improving data in emissions inventories, and
- Set priorities for improving data in emissions inventories, and
- Help direct priorities for expanding and improving the network of air toxics monitoring.

The Louisiana Department of Environmental Quality (LDEQ) has worked with EPA to measure concentrations of chloroprene using monitors around the facility. Six monitors are maintained by EPA in areas adjacent and near the plant. Additionally, Denka maintains six monitors of their own in and around their site. LDEQ receives data from both EPA and Denka monitoring.

The Administrative Order on Consent

Denka voluntarily agreed to take actions to reduce air pollution from the plant. LDEQ worked with Denka to craft an Administrative Order on Consent (AOC), a legal contract, in which Denka agreed to install a series of new control technologies and measures designed to reduce emissions of chloroprene by 85 percent from the facility's 2014 chloroprene emissions. EPA supports LDEQ setting an enforceable schedule to make the needed changes to the facility. Denka has committed to spend more than $17 million to reduce chloroprene emissions.

Under the AOC, emission reductions devices will be installed on a set schedule, culminating with the installation of the Regenerative Thermal Oxidizer (RTO) by the end of the fourth quarter of 2017. The first two phases have been installed and are operating. Denka has applied for an extension of time for installation of the third phase because of complexities in the engineering design for the modification. The final phase will be the installation of the RTO. The RTO is on-site awaiting installation.

What about .2?

Once the control measures are in place, LDEQ will again assess the emissions at the Denka facility. While there is currently no federal or state standard for allowable concentrations of chloroprene in the air, EPA has offered a concentration value of 0.2 micrograms per cubic meter (ug/m^3) to guide efforts to reduce emissions. The 0.2 ug/m^3 is not an air quality standard; it represents a guide for a lifetime (not short or daily) average.

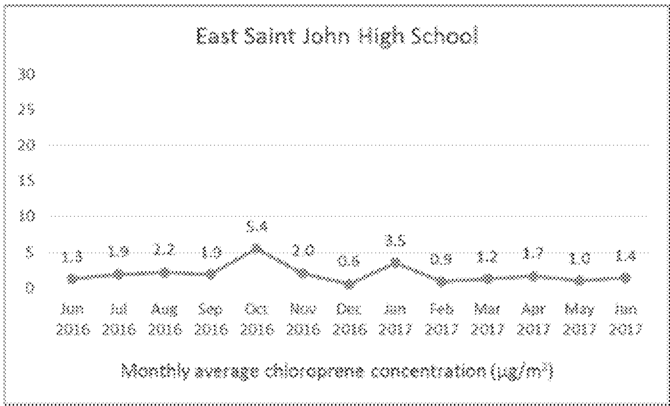
Questions about the school

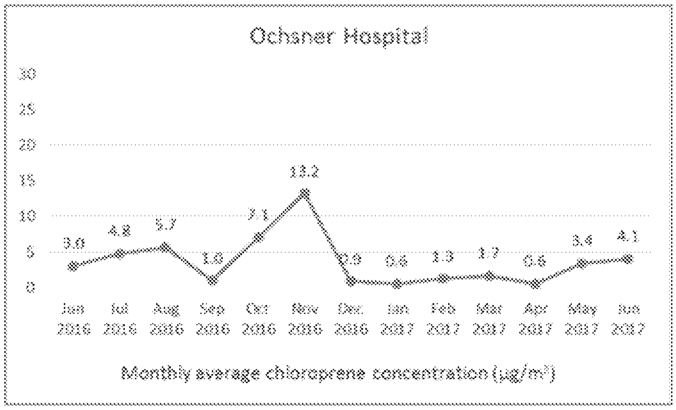
Some LaPlace residents voiced concerns about the risk at the 5th Ward Elementary School, which is near the Denka plant. The Louisiana Department of Health (LDH) and LDEQ conferred regarding the environmental status at the school. LDH officials indicated they have found no reason that children cannot attend the school. Monitoring results from the EPA monitor at this location and available on the EPA website (below) has shown elevated concentrations of chloroprene on some days. This does not indicate continuous exposure.

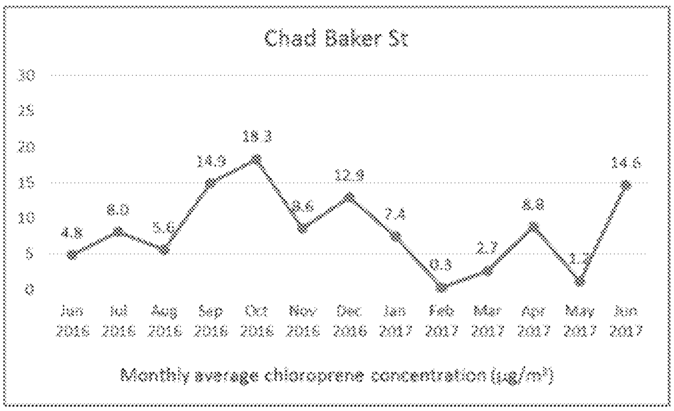
Monitoring results

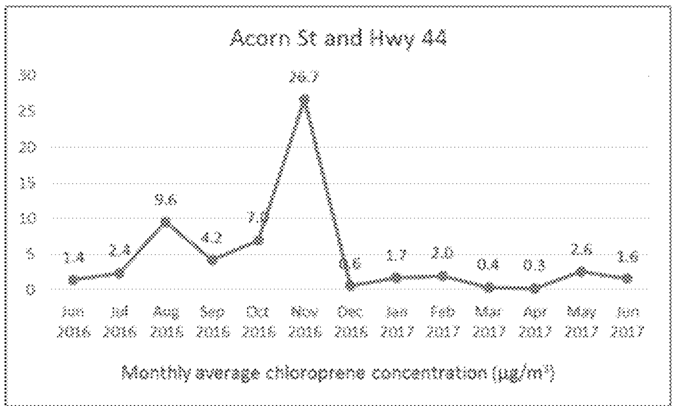
For EPA's monitoring results, go to https://www.epa.gov/la/laplace-st-john-baptist-parish-louisiana

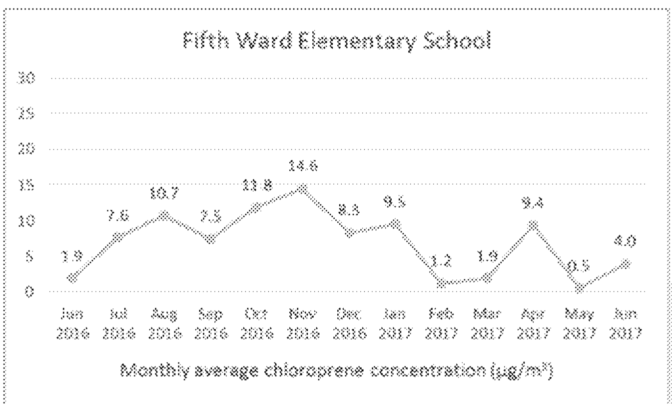
Here are the most recent month's monitoring results from EPA's monitors:

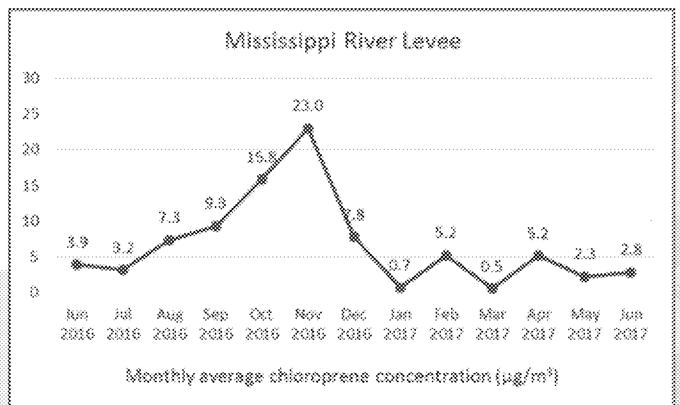












For more information:
Contact Greg Langley, LDEQ Press Secretary,
at (225) 219-3964, email Gregory.Langley@la.gov.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 ROSS AVENUE, SUITE 1200

Technical Data Analysis Report:
Air Monitoring Activities for Chloroprene
Concentrations near
the Denka Performance Elastomer LLC Facility
in LaPlace, Louisiana
May 2016 through June 2017

September 2017

INTRODUCTION

The U.S. Environmental Protection Agency (EPA) and the Louisiana Department of Environmental Quality (LDEQ) have collaborated to monitor and improve the air quality in the community of LaPlace, Louisiana. This collaboration has included ambient air monitoring in the neighborhoods surrounding the Denka Performance Elastomer LLC (Denka) Pontchartrain Plant and actions requiring Denka to institute control measures to reduce the emissions from the facility. The purposes of this report are to summarize the results of the ambient air monitoring activities conducted near the Denka facility in the LaPlace neighborhoods through the reporting period and to track the concentrations of chloroprene in ambient air quality resulting from Denka's corrective actions.

NATA Background

EPA's National Air Toxics Assessment (NATA) is a screening-level risk assessment which contains emissions data and uses models to make broad estimates of health risks over geographic areas of the country. The NATA tool can be used by state/local/tribal agencies to gain a better understanding of risks in their areas and prioritize the evaluation of air pollutants and emission sources in locations of interest. NATA uses emissions and estimated inhalation exposures of hazardous air pollutants, and modeled ambient conditions to calculate risk from air emission sources.

The NATA, released in December 2015 and based on emissions estimates from 2011, indicated that several census tracts in the vicinity of LaPlace, St. John the Baptist Parish, Louisiana have an increase in estimated cancer risks and warranted further evaluation. The increase in estimated risks are driven by chloroprene emissions. Based on 2011 emissions estimates reported in LDEQ's emissions inventory, Denka is the only facility in LaPlace with chloroprene emissions. Prior to releasing the assessment, EPA confirmed the emissions data used in NATA with the facility (Denka and former owner DuPont). As part of EPA's continuing re-assessment of chemical risk, in 2010 EPA examined chloroprene and classified the risk level as a likely carcinogen.[1]

Initial and On-going Monitoring Activities

In response to these modeled chloroprene emissions into the ambient air, EPA, LDEQ, and Denka have placed monitors in the nearby neighborhoods and along the property boundaries of the facility. In March 2016, EPA Region 6 and LDEQ conducted initial ambient air sampling to determine if levels of chloroprene could be detected in the neighborhoods around the facility. The results showed that chloroprene was in the ambient air and at levels above the lifetime cancer risk inhalation exposure concentration[2]. The report of this monitoring program is found in EPA's Memorandum to File: *Evaluation of Ambient Air Sampling Results from the Area Surrounding the Denka/DuPont Facility in LaPlace, LA in March 2016*, dated May 10, 2016,

[1] https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?&substance_nmbr=1021
[2] EPA's inhalation risk factor is 0.2 ug/m^3 for a 100-in-1,000,000 cancer risk for chloroprene.

and posted to EPA's website ([HYPERLINK "https://www.epa.gov/la/laplace-st-john-baptist-parish-louisiana"]).

Based on the initial sampling, EPA determined that extended monitoring in the neighborhoods around the facility was necessary to learn more about the levels of chloroprene in the ambient air. EPA and LDEQ developed an ambient air monitoring plan to measure chloroprene at six locations in the neighborhoods of LaPlace. Ambient air monitoring started on May 24, 2016, and is expected to continue through December 2018. This report contains the results of this ambient monitoring and analyses of the sample data from May 25, 2016, through June 28, 2017 (reporting period).

After seeing the results of the initial (grab) sampling in the area, LDEQ requested that Denka also conduct its own monitoring, along the facility property boundaries. Initially, Denka's air monitoring was to measure chloroprene at five locations along the property boundary. Air monitoring started on August 9, 2016. Denka added a sixth site at the end of October 2016 on the other side of the Mississippi River in Edgard, LA. Results of Denka's air monitoring can be found in LDEQ's Electronic Data Management System (EDMS) ([HYPERLINK "http://edms.deq.louisiana.gov/app/doc/querydef.aspx"]) using the Denka Agency Information (AI) number: 199310.

Denka Background

On November 1, 2015, Denka acquired ownership of its Pontchartrain Plant, located at 560 Highway 44 in LaPlace, St. John the Baptist Parish, Louisiana, from the E.I. DuPont de Nemours, LLC (DuPont – Pontchartrain Works facility). The Denka-Pontchartrain facility manufactures neoprene rubber. Neoprene is used to make wet suits, automotive parts, electrical insulators, landfill liners, and other useful materials. Chloroprene is a chemical component of the production of neoprene.

On December 10, 2014, DuPont and Denka Co. Ltd. announced an agreement to sell DuPont's Neoprene facility to Denka Co. Ltd. Founded in 1915, Denka Co. Ltd. is headquartered in Tokyo, Japan. The owner and operator of the facility is Denka Performance Elastomer, LLC, a newly formed joint venture in which Denka Co. Ltd. owns 70 percent and Mitsui Co. Ltd., also based in Tokyo, owns 30 percent. The joint venture, which became effective on November 1, 2015, was established as a result of their acquisition of DuPont's Neoprene business.

MONITORING PLANS and METHODS

EPA Ambient Air Monitoring

EPA chose six sites in the LaPlace neighborhoods surrounding the Denka facility for ambient air monitoring. EPA uses stainless steel, volatile organic compound (VOC) canisters to collect the ambient air for 24 hours every three days. The ambient air monitoring began on May 25, 2016, with collection at each of the six sites, and is expected to continue through December 2018. One additional collocated sample is also collected from one of the six locations; the location is chosen based on the probable downwind monitor location predicted for the day of the monitoring. EPA established a meteorological station to collect weather data during each 24-hour sampling round. These monitoring location are listed in Table 1 and shown on Figure 1.

Table 1: EPA Monitoring Locations in Neighborhoods Surrounding Denka Facility

Name	Address	Latitude	Longitude
Ochsner Hospital	502 Rue de Sante, LaPlace, LA	30.071420°	-90.515436°
Acorn St and Highway 44	Intersection of Acorn Street at Highway 44, LaPlace, LA	30.058785°	-90.509599°
Mississippi River Levee	South of 568 Highway 44, LaPlace, LA	30.051803°	-90.522571°
Fifth Ward Elementary School	158 Panther Drive, Reserve, LA	30.051938°	-90.531859°
238 Chad Baker Street	238 Chad Baker Street, LaPlace, LA	30.057070°	-90.533381°
East St. John the Baptist High School	1 Wildcat Drive, Reserve, LA	30.077830°	-90.532944°
Ochsner Hospital Meteorological Station	502 Rue de Sante, LaPlace, LA	30.072270°	-90.514800°

The sampling plan was designed to collect data on concentrations of chloroprene in ambient air and meteorological information associated with the time period of the monitoring. Eventually, the ambient air monitoring data can be used to track emission reductions by Denka. The samples are analyzed for chloroprene using EPA's analytical method [HYPERLINK "https://www.epa.gov/homeland-security-research/epa-air-method-toxic-organics-15-15-determination-volatile-organic"], with a method detection limit (MDL)[3] of 0.036 micrograms per cubic meter ($\mu g/m^3$). The samples are sent to Eastern Research Group (ERG) laboratory, an EPA-contracted laboratory, for analysis. Then, approximately 10% of the final data packages are reviewed for quality assurance and quality control by the EPA Houston Laboratory, which has not been involved in analyzing the data.

[3] EPA defines MDL as the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.

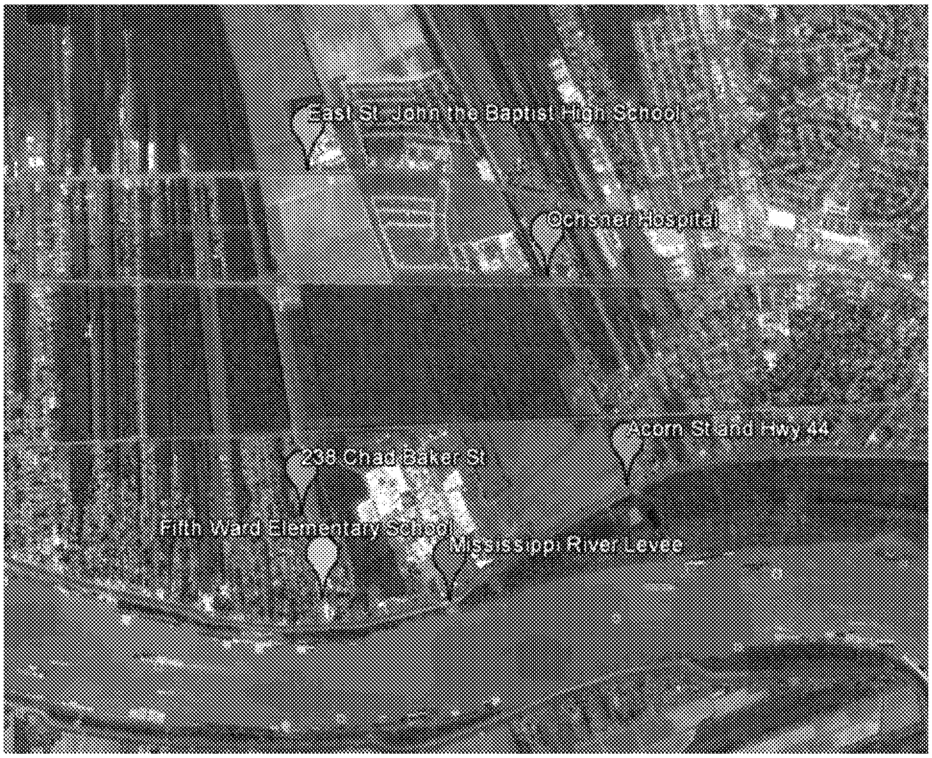

Figure 1. EPA Ambient Air Monitoring Locations, LaPlace, LA

MONITORING RESULTS

EPA Monitoring Results

EPA's 24-hour monitoring results show that chloroprene was detected in ambient air at the monitoring locations in the neighborhoods surrounding Denka. See Attachment 1 for monitoring collection dates and chloroprene concentrations at each location. See Attachment 2 for graphical presentation of the data. For this report, EPA evaluated results collected from May 25, 2016, through June 28, 2017 (reporting period). Samples were collected on 130 separate days, out of a maximum133 possible sample attempts. Samples were not collected from any location on May 28, 2016, due to equipment failure and during the period of August 14 through 20, 2016, due to local flooding which prevented access to the monitoring locations. Samples were not collected on individual days from individual monitoring locations as follows:

- August 23, 2016: Levee location; equipment failure
- August 23, 2016: Ochsner Hospital location; equipment failure
- September 07, 2016: 238 Chad Baker; equipment failure
- January 8, 2017: Ochsner Hospital location; equipment failure
- April 26, 2017: East St. John the Baptist High School; equipment failure.

To calculate the average chloroprene concentration at each location for the sampling period, EPA utilized the following protocols to define numeric values for those samples that did not have measurable chloroprene concentrations (non-detect samples) and for collocated samples:

- For non-detect sample concentrations, the concentration for non-detect samples were assigned a value of 0.018 micrograms per cubic meter ($\mu g/m^3$), which is one-half of the MDL[4] (0.036 $\mu g/m^3$).
- For collocated samples, the concentrations from both canisters for that day were averaged and calculated as one value for the site. The collocated monitoring location is chosen based on the probable downwind monitor location predicted for the day of the monitoring.

For the purpose of this report, measureable concentrations below the MDL are used numerically as reported in the calculations. The number of samples and range of concentrations for each monitoring location are shown in Table 2. Note: Collocated samples are considered one sample; the values of the collocated samples are averaged and represent one result.

Table 2. Chloroprene Ambient Air Concentrations at Six Locations from May 25, 2016 to June 28, 2017

Sampling Location	Number of Samples Collected	Range of Chloroprene Concentration ($\mu g/m^3$)
Ochsner Hospital	130	Non-Detect – 67
Acorn and Hwy 44	130	Non-Detect -153
Levee	128	Non-Detect -147
Fifth Ward Elementary School	129	Non-Detect – 75
238 Chad Baker	129	Non-Detect - 46
East St. John the Baptist High School	129	Non-Detect – 25
Notes: $\mu g/m^3$ = micrograms per cubic meter		

DATA QUALITY/QUALITY CONTROL/PRECISION/COLLOCATION

EPA Data Quality

EPA developed a Sampling and Analysis Plan (SAP) and a Quality Assurance Project Plan (QAPP) to evaluate chloroprene concentrations in the neighborhoods surrounding the Denka facility. The objectives of the SAP are to quantify ambient air levels of chloroprene and provide a basis for additional control measures. The purpose of the QAPP is to describe the quality

[4] EPA defines MDL as the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.

assurance/quality control procedures for ambient air monitoring and sample analysis that will be utilized when collecting and quantifying chloroprene from the monitoring samples.

EPA Quality Control

EPA's Region 6 Houston Laboratory reviewed the quality of sample data results provided by ERG, and agreed with the identification and quantitation of the chloroprene results from the ambient air monitoring in the neighborhoods surrounding the Denka facility. Data from approximately ten percent of the samples collected from areas surrounding the Denka facility in LaPlace, Louisiana between May 2016 and June 2017 (reporting period) were submitted for review.

EPA's Region 6 Houston Laboratory notified ERG of two areas of weakness in quality control. Each weakness is associated with documentation of procedure and is not associated with the analytical methodology. First, the analytical laboratory was inconsistent in providing canister certification blank data or tracking of the canister blanks. This certification process assures that the canisters are clean prior to use. Upon notification, the analytical laboratory provided the certificate and now includes each certificate with the data packages. Second, the analytical laboratory did not provide standard tracking information to document the instrument performance check standard. This laboratory practice ensures the quality and reliability of the analytical results. The laboratory provided the performance check standards when notified of the omission. ERG promptly corrected the areas of weakness and the EPA's quality of data was not affected.

Collocation of Samples

EPA collects collocated samples for each day of sampling at one of the six ambient air monitoring locations. The collocated sample location is selected based on the projected downwind location for that day. EPA uses a +/- 25% relative percent difference as the acceptable quality goal between the collocated samples, which correlates to EPA's goal for ambient air monitoring[5]. Comparing the relative percent difference of all the collocated monitoring samples collected during the reporting period from May 25, 2016 through June 28, 2017, the average relative percent difference is 8.4%, which conforms to the EPA ambient air monitoring goal.

ANALYSIS OF RESULTS

EPA calculated the monthly average chloroprene concentrations at each of its six monitoring locations. EPA compared the meteorology data (wind speed, temperature, and relative humidity) to the chloroprene concentrations in ambient air. EPA evaluated the neoprene production

[5] U.S.EPA (1999). Compendium Method TO-15: Determination Of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS), 2nd Ed. Cincinnati, OH, US Environmental Protection Agency, Office of Research and Development.

quantities and the chloroprene concentrations in ambient air. Refer to Table 2 for the ranges of chloroprene concentrations for each location.

Monthly Averages

EPA averaged the concentrations of chloroprene for each full month of sampling from June 2016 through June 2017, and have shown the results per site in Attachment 2. Monthly average concentrations of chloroprene increased from August 2016 through November 2016 at each location, except the East St. John the Baptist High School location. Monthly average concentrations of chloroprene notably increased in June 2017 at the Chad Baker Street location. Increases in the monthly averages for November 2016 at the Mississippi Levee and the 44th and Acorn locations are influenced by individual daily chloroprene concentrations of 147 μg/m^3 and 153 μg/m^3, respectively, on November 21, 2016.

Analysis of High Concentrations and Meteorological Factors

EPA compared the maximum daily concentration of chloroprene to the wind speed (see Figure 2) to evaluate the effect of wind speed on chloroprene concentration. For each sampling day, EPA selected for comparison the maximum chloroprene concentration for that day from any of the six locations and the daily average wind speed as calculated from the data recorded at the Ochsner Hospital meteorological station.

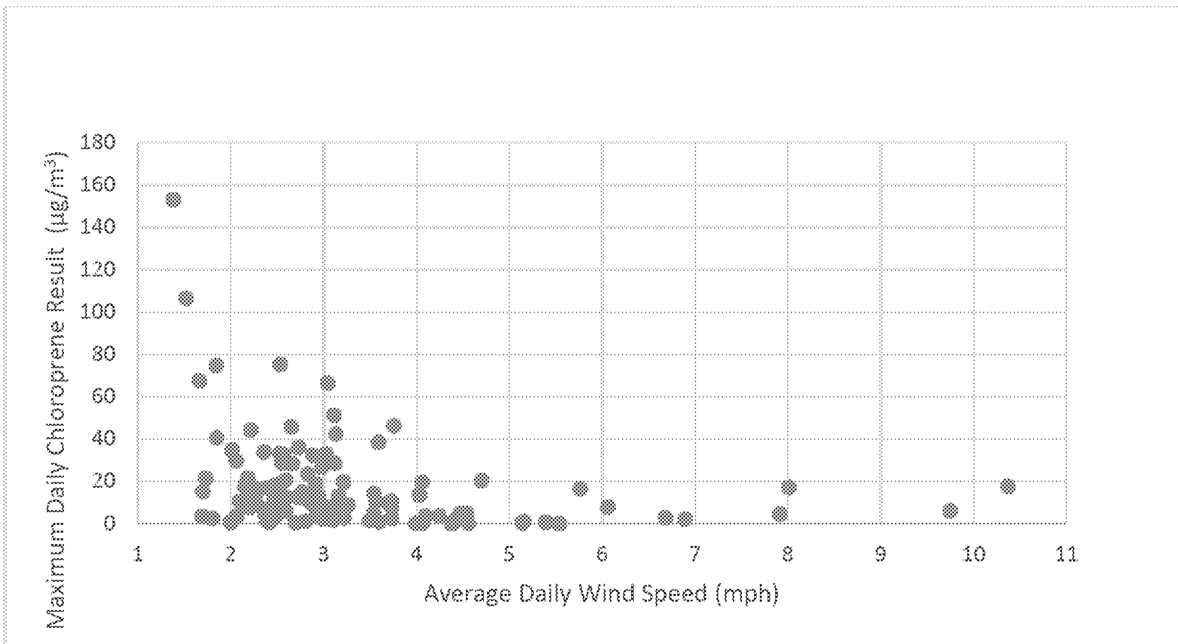

Figure 2. Chloroprene Concentration Compared to Wind Speed

The hourly average wind speed is calculated by adding all measurements for one hour, recorded per minute, and dividing the total by 60. The period of measurement for a day is from the first minute of the first entire hour in which the monitoring began until the last minute of the hour in which monitoring ended, for 24 hours. The daily average wind speed is calculated by adding the hourly average wind speeds and dividing by 24. This comparison does not differentiate the wind direction.

Eleven samples with the maximum daily chloroprene concentrations were collected when the daily average wind speed was less than 2 miles per hour. These 11 samples had an average maximum daily chloroprene concentration of 50.1 $\mu g/m^3$. Thirteen samples were collected when the daily average wind speed was equal to or greater than 5 miles per hour. These 13 samples had an average maximum daily chloroprene concentration of 5.99 $\mu g/m^3$. EPA notes that higher maximum daily chloroprene concentrations were observed when the average wind speed drops. This observation is consistent with lower wind speeds causing less dispersion, which may result in higher chloroprene concentrations in the ambient air.

EPA also compared the daily average temperature to the maximum daily concentration of chloroprene in the ambient air. The hourly average temperature is calculated by adding all measurements for one hour, recorded per minute, and dividing the total by 60. The period of measurement for a day is from the first minute of the first entire hour in which the monitoring began until the last minute of the hour in which monitoring ended, for 24 hours. The daily average temperature is calculated by adding the hourly average temperatures and dividing by 24.

EPA did not observe a correlation between temperature and chloroprene concentrations. Temperature does not appear to influence the chloroprene concentrations in ambient air.

Production Schedule Correlation

EPA compared the pounds of neoprene produced[6] to the average of the maximum daily chloroprene concentrations from August 2016 through June 2017 (see Figure 3). EPA calculated Denka's monthly average neoprene production by adding the daily neoprene production values for each day of the month together and dividing by the number of days of production within that month. EPA calculated the monthly average of maximum chloroprene concentrations in the ambient air by adding the maximum daily concentration for each day from any of the six locations and dividing by the number of days of monitoring within that month. EPA used the maximum daily chloroprene concentration to evaluate the highest potential risk associated with production volume. NOTE: In August 2016, Denka began providing neoprene production information to LDEQ and EPA as part of the additional reporting requested by LDEQ in June 2016.

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[6] Neoprene production numbers are reported monthly by Denka to LDEQ. See [HYPERLINK "http://edms.deq.louisiana.gov/app/doc/querydef.aspx"] and reference Agency Identifier: 199310.

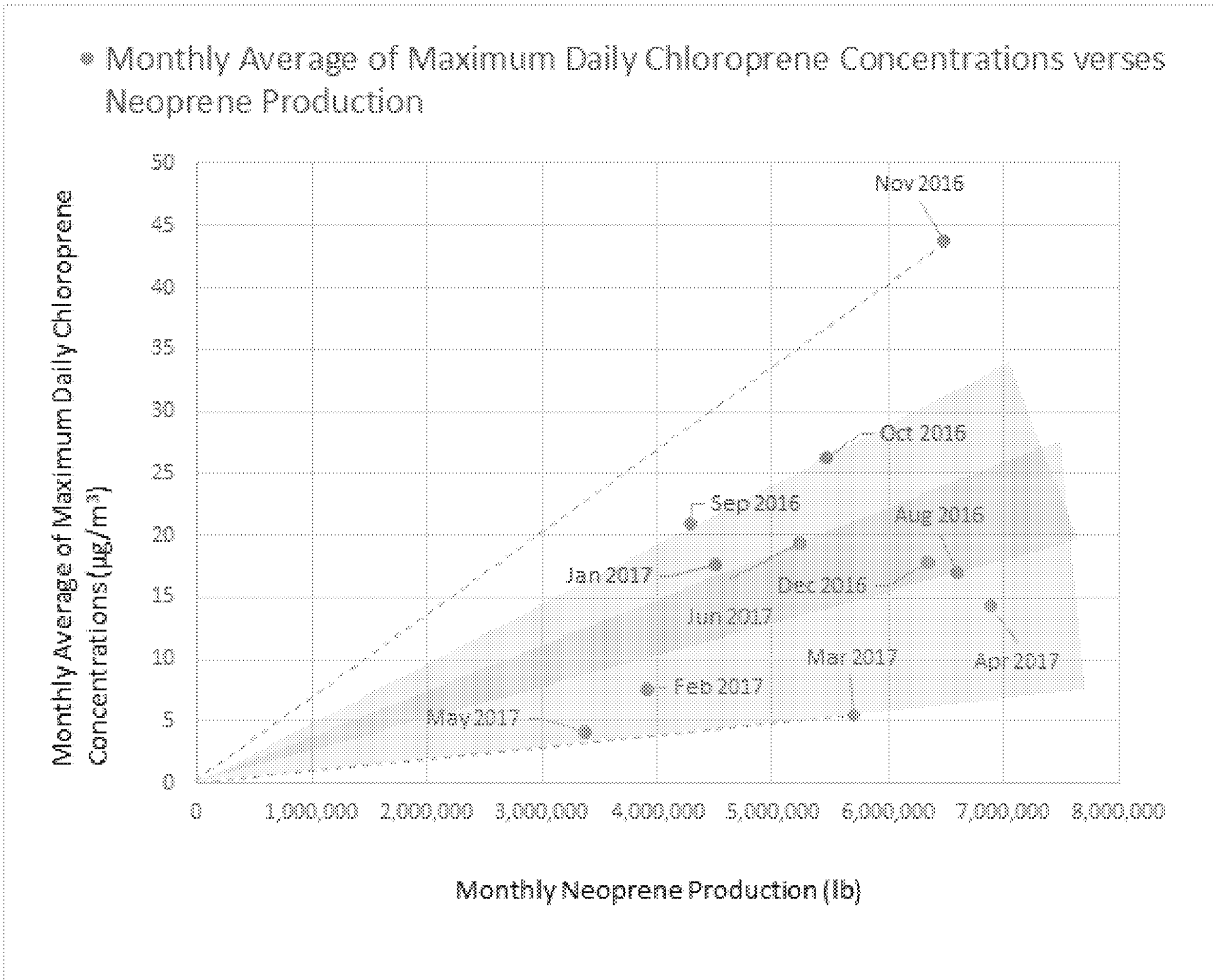

Figure 3. Chloroprene Concentration in Ambient Air Compared to Neoprene Production

The graph shows two areas of similar values for the period of August 2016 through June 2017, with one outlier for the month of November 2016. The monthly average of maximum daily chloroprene concentrations in the ambient air from August 2016 through January 2017 ranged from 14.9 $\mu g/m^3$ to 26.7 $\mu g/m^3$, with production rates of approximately 4,250,000 pounds to approximately 6,500,000 pounds. In contrast, the monthly average of maximum daily chloroprene concentrations in the ambient air from February 2017 through June 2017 ranged from 3.4 $\mu g/m^3$ to 19.3 $\mu g/m^3$, with production rates of approximately 3,370,000 pounds to 6,890,000 pounds. EPA notes that Denka installed and began operating a condenser unit in February 2017. The condenser unit is designed to capture waste gas which has previously been released from vents and route it to Denka's HCl Furnace where the waste gas will be treated prior to release to the ambient air. While the data shows a reduction in ambient air levels of chloroprene measured since February 2017, there is incomplete data to confirm the cause for the reduction.

VOLUNTARY COMPLIANCE ACTIONS

On January 6, 2017, Denka entered into an Administrative Order on Consent with LDEQ. In the Order, Denka agreed to implement a series of emission control projects that are expected to reduce chloroprene emissions by 85% from the 2014 emission inventory, which was the most recent and current inventory at the time of the Order. These control projects include installation and operation of a brine condenser on the Poly Kettles Vent, a vacuum pump and brine condenser on the Chloroprene (CD) Refining Column, the routing of several emissions sources for combustion in the hydrogen chloride (HCl) Unit, and installation and operation of a Regenerative Thermal Oxidizer (RTO).

- Beginning in January 2017, the Brine Condenser on the Poly Kettle Vents was installed during a scheduled facility shutdown. All pre-start up safety reviews and authorizations were completed the first week of February; the equipment has been in service since then.
- Denka installed the equipment and instrumentation for the CD Refining Column Condenser in May 2017 and successfully tested the equipment during June 2017. The routing of emissions to the HCl Unit is scheduled to be completed in the fall of 2017.
- In June 2017, Denka reported that fabrication of the RTO had begun, site preparation for construction of the RTO was underway, and the site personnel were being trained on operation, maintenance and control of the RTO.

While Denka has been installing the pollution controls in stages throughout the year, the last control – the RTO – is scheduled to be completed in December 2017. Other Denka compliance activities continuing and completed include:

- Capping of open-ended lines in the chloroprene process area with rubber plugs;
- Monitoring and maintenance of regulated components under Denka's Leak Detection and Repair system; and
- Confirming calibration and response factor for chloroprene to ensure leaks are detected during monitoring.

NEXT STEPS

Denka will conduct monitoring along its property boundary for six months after installation of the RTO in December 2017 to determine the effectiveness of the emission reduction projects on the ambient air concentrations of chloroprene.

EPA's monitoring for chloroprene in the neighborhoods surrounding Denka is scheduled to continue through 2018. EPA remains primarily concerned about the potential for long-term risk from chloroprene emissions to the community.

AVAILABILITY OF DATA

EPA's air sampling data and evaluations are available on the internet at [HYPERLINK "https://www.epa.gov/la/laplace-st-john-baptist-parish-louisiana"] .

Denka's air monitoring data can be found on the internet at LDEQ's EDMS: [HYPERLINK "http://edms.deq.louisiana.gov/app/doc/querydef.aspx"] using the Denka Agency Information (AI) number: 199310.

LDEQ and EPA worked in collaboration to provide an information pamphlet with current information to the citizens of St. John the Baptist parish. A copy of which can be found in Attachment 3 at the end of this report.

Attachment 1: EPA Analytical Information

Attachment 2: EPA Monitoring Locations, Analytical Data Points, Monthly Averages

Attachment 3: LDEQ Informational Pamphlet:
Denka: The Path Forward

The pamphlet is a featured article and posted on the St. John the Baptist Parish website at http://www.sjbparish.com/.

DENKA Air Monitoring Summary Sheet
May 25 - November 15

DATE	Month	Units	Day	238 Chad Baker	Acorn and Hwy 44	East St. John the Baptist High School	Fifth Ward Elementary School	Levee
05/25/16	5	(µg/m^3)	4	ND	1.29	0.831	ND	ND
05/25/16 (collocated)		(µg/m^3)	4	--	--	--	ND	--
05/28/16	5	(µg/m^3)	7	--	Invalid	Invalid	--	Invalid
05/28/16 (collocated)		(µg/m^3)	7	--	--	Invalid	--	--
05/31/16	5	(µg/m^3)	3	7.58	30.3	2.02	3.07	6.13
05/31/16 (collocated)		(µg/m^3)	3	--	--	--	--	--
06/02/16	6	(µg/m^3)	5	7.15	0.073	2.67	1.88	2.64
06/02/16 (collocated)		(µg/m^3)	5	--	--	--	--	--
06/05/16	6	(µg/m^3)	1	11.1	ND	0.341	4.97	20.5
06/05/16 (collocated)		(µg/m^3)	1	--	ND	--	--	--
06/09/16	6	(µg/m^3)	5	5.48	0.624	1.25	3.41	4.93
06/09/16 (collocated)		(µg/m^3)	5	--	--	--	--	4.72
06/12/16	6	(µg/m^3)	1	5.37	0.983	5.15	0.573	0.272
06/12/16 (collocated)		(µg/m^3)	1	--	--	5.73	--	--
06/15/16	6	(µg/m^3)	4	1.21	0.225	1.07	1.74	0.366
06/15/16 (collocated)		(µg/m^3)	4	--	--	0.990	--	--
06/18/16	6	(µg/m^3)	7	7.87	4.39	0.268	1.89	2.70
06/18/16 (collocated)		(µg/m^3)	7	--	4.21	--	--	--
06/21/16	6	(µg/m^3)	3	5.08	ND	1.04	1.30	0.413
06/21/16 (collocated)		(µg/m^3)	3	--	--	--	1.49	--
06/24/16	6	(µg/m^3)	6	0.305	6.82	0.029 U	ND	0.319
06/24/16 (collocated)		(µg/m^3)	6	--	--	--	--	0.540
06/27/16	6	(µg/m^3)	2	0.163	1.19	0.417	ND	0.040
06/27/16 (collocated)		(µg/m^3)	2	--	1.19	--	--	--
06/30/16	6	(µg/m^3)	5	4.53	ND	0.352	3.50	7.15

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Ochsner Hospital	Sample Round Max	Max Site
ND	1.29	
--	0.00	None
--	0.00	None
--	0.00	None
17.5	30.32	2.00
--	0.00	None
0.083	7.15	1.00
0.047	0.05	6.00
0.809	20.49	5.00
--	0.00	None
4.68	5.48	1.00
--	4.72	5.00
1.28	5.37	1.00
--	5.73	3.00
10.8	10.81	6.00
--	0.99	1.00
2.98	7.87	1.00
--	4.21	1.00
0.686	5.08	1.00
--	1.49	1.00
7.54	7.54	1.00
--	0.54	1.00
1.61	1.61	6.00
--	1.19	2.00
ND	7.15	5.00

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	238 Chad Baker	Acorn and Hwy 44	East St. John the Baptist High School	Fifth Ward Elementary School	Levee	Ochsner Hospital	Overall
Number of ND	7	20	9	11	8	17	72
Number of Samples	53	40	50	48	51	43	285
Sum	615.270	521.340	148.879	518.124	621.355	355.768	2781
Average	10.26	8.69	2.53	8.79	10.53	5.93	7.79
Maximum	46.1	153	24.9	66.375	147	66.7	

Average on Sample Day

	238 Chad Baker	Acorn and Hwy 44	East St. John the Baptist HS	Fifth Ward ES	Levee	Ochsner Hospital	Overall
Sunday	16.62	7.13	3.68	13.54	14.60	3.45	
Monday	12.14	35.34	2.80	16.55	23.91	19.35	
Tuesday	17.29	33.15	5.90	15.98	21.67	19.79	
Wednesday	8.02	0.98	0.77	3.73	1.67	4.28	
Thursday	7.08	4.07	1.56	11.45	4.92	2.05	
Friday	15.44	3.65	1.37	8.48	6.68	2.91	
Saturday	3.38	3.65	4.74	2.77	6.21	4.21	

No. of Max Samples

Percent of Samples	21	6	1	12	14	7
	34.43%	9.84%	1.64%	19.67%	22.95%	11.48%
By Month						
June	6	3	6	6	6	6
July	3					
August	2					
September	4					
October	5					
November	1					

DENKA Air Monitoring Summary Sheet
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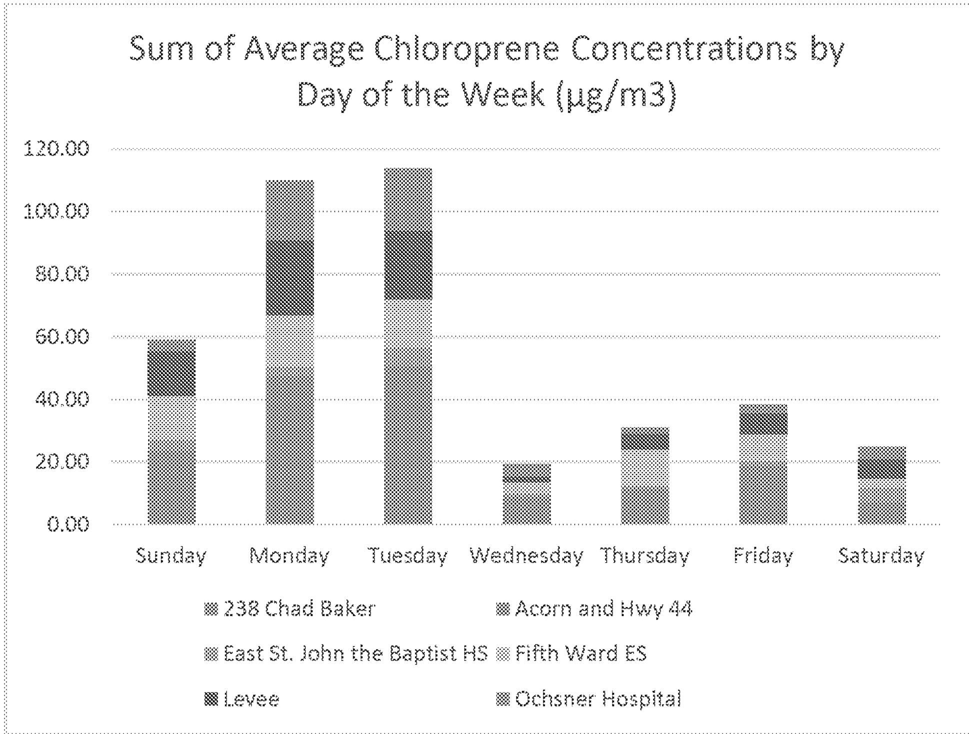

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06/30/16 (collocated)		**(µg/m³)**	**5**	4.21	--	--	--	--
07/03/16	**7**	**(µg/m³)**	**1**	ND	0.054	1.69	ND	ND
07/03/16 (collocated)		**(µg/m³)**	**1**	--	--	--	--	--
07/06/16	**7**	**(µg/m³)**	**4**	ND	ND	0.120	ND	ND
07/06/16 (collocated)		**(µg/m³)**	**4**	--	--	--	--	--
07/09/16	**7**	**(µg/m³)**	**7**	1.71	4.75	0.762	0.345	1.88
07/09/16 (collocated)		**(µg/m³)**	**7**	--	--	--	--	--
07/12/16	**7**	**(µg/m³)**	**3**	6.89	1.23	2.36	5.62	0.722
07/12/16 (collocated)		**(µg/m³)**	**3**	--	--	2.70	--	--
07/15/16	**7**	**(µg/m³)**	**6**	12.4	0.881	0.914	3.63	6.46
07/15/16 (collocated)		**(µg/m³)**	**6**	--	--	--	--	--
07/18/16	**7**	**(µg/m³)**	**2**	37.0	ND	0.276	44.3	1.70
07/18/16 (collocated)		**(µg/m³)**	**2**	33.2	--	--	--	--
07/21/16	**7**	**(µg/m³)**	**5**	5.01	1.18	2.12	11.3	4.90
07/21/16 (collocated)		**(µg/m³)**	**5**	--	--	--	11.3	--
07/24/16	**7**	**(µg/m³)**	**1**	16.7	9.07	8.16	8.09	9.47
07/24/16 (collocated)		**(µg/m³)**	**1**	--	--	--	--	10.0
07/27/16	**7**	**(µg/m³)**	**4**	ND	1.71	0.196	ND	ND
07/27/16 (collocated)		**(µg/m³)**	**4**	--	--	--	--	--
07/30/16	**7**	**(µg/m³)**	**7**	2.49	5.30	2.67	3.15	6.35
07/30/16 (collocated)		**(µg/m³)**	**7**	--	--	--	--	--
08/02/16	**8**	**(µg/m³)**	**3**	0.254	0.881	1.86	10.3	16.8
08/02/16 (collocated)		**(µg/m³)**	**3**	--	--	--	--	--
08/05/16	**8**	**(µg/m³)**	**6**	5.84	12.5	2.39	8.67	21.4
08/05/16 (collocated)		**(µg/m³)**	**6**	--	12.7	--	--	--
08/08/16	**8**	**(µg/m³)**	**2**	0.417	4.86	1.63	0.569	2.77
08/08/16 (collocated)		**(µg/m³)**	**2**	--	5.98	--	--	--
08/11/16	**8**	**(µg/m³)**	**5**	ND	12.8	ND	ND	0.649
08/11/16 (collocated)		**(µg/m³)**	**5**	--	--	--	--	--
08/14/16	**8**	**(µg/m³)**	**1**	Invalid	Invalid	Invalid	Invalid	Invalid
08/14/16 (collocated)		**(µg/m³)**	**1**					

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--	4.21	1.00
4.28	4.28	6.00
--	0.00	None
9.61	9.61	6.00
--	0.00	None
6.02	6.02	6.00
6.64	6.64	6.00
0.232	6.89	1.00
--	2.70	3.00
1.53	12.44	1.00
1.73	1.73	6.00
ND	44.25	4.00
--	33.15	1.00
1.06	11.28	4.00
--	11.28	4.00
10.0	16.72	1.00
--	10.01	5.00
3.59	3.59	6.00
3.70	3.70	6.00
11.2	11.21	6.00
10.8	10.77	6.00
6.56	16.76	5.00
5.95	5.95	6.00
5.48	21.40	5.00
--	12.73	2.00
0.827	4.86	2.00
--	5.98	2.00
2.43	12.80	2.00
2.23	2.23	6.00
Invalid	0.00	None
	0.00	1.00

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08/17/16	8	**(µg/m³)**	**4**			No Samples Collected Due to Flooding in the Area		
08/17/16 (collocated)		**(µg/m³)**	**4**			No Samples Collected Due to Flooding in the Area		
08/20/16	8	**(µg/m³)**	**7**			No Samples Collected Due to Flooding in the Area		
08/20/16 (collocated)		**(µg/m³)**	**7**			No Samples Collected Due to Flooding in the Area		
08/23/16	8	**(µg/m³)**	**3**	5.19	34.7	8.56	--	--
08/23/16 (collocated)		**(µg/m³)**	**3**	--	--	--	--	--
08/26/16	8	**(µg/m³)**	**6**	1.61	0.468	0.301	6.06	2.23
08/26/16 (collocated)		**(µg/m³)**	**6**	1.65	--	--	--	--
08/29/16	8	**(µg/m³)**	**2**	25.6	ND	0.627	38.4	0.073
08/29/16 (collocated)		**(µg/m³)**	**2**	--	--	--	38.8	--
09/01/16	9	**(µg/m³)**	**5**	0.798	ND	ND	13.1	8.09
09/01/16 (collocated)		**(µg/m³)**	**5**	--	--	--	11.0	--
09/04/16	9	**(µg/m³)**	**1**	31.0	39.2	10.2	34.7	74.7
09/04/16 (collocated)		**(µg/m³)**	**1**	30.7	--	--	--	--
09/07/16	9	**(µg/m³)**	**4**	*33.8*	2.21	2.17	3.44	2.14
09/07/16 (collocated)		**(µg/m³)**	**4**	33.8	--	--	--	--
09/10/16	9	**(µg/m³)**	**7**	10.9	0.160	4.90	6.27	2.53
09/10/16 (collocated)		**(µg/m³)**	**7**	10.7	--	--	--	--
09/13/16	9	**(µg/m³)**	**3**	46.1	ND	0.120	16.1	0.232
09/13/16 (collocated)		**(µg/m³)**	**3**	44.3	--	--	--	--
09/16/16	9	**(µg/m³)**	**6**	28.6	ND	0.921	0.693	ND
09/16/16 (collocated)		**(µg/m³)**	**6**	24.7	--	--	--	--
09/19/16	9	**(µg/m³)**	**2**	ND	0.105	0.033	ND	1.320
09/19/16 (collocated)		**(µg/m³)**	**2**	--	--	--	--	--
09/22/16	9	**(µg/m³)**	**5**	0.363	ND	0.065	0.722	0.18
09/22/16 (collocated)		**(µg/m³)**	**5**	--	--	--	0.664	--
09/25/16	9	**(µg/m³)**	**1**	0.109	0.073	0.127	0.105	0.548
09/25/16 (collocated)		**(µg/m³)**	**1**	0.138	--	--	--	--
09/28/16	9	**(µg/m³)**	**4**	0.073	0.432	0.051	0.555	3.37
09/28/16 (collocated)		**(µg/m³)**	**4**	--	--	--	--	3.49
10/01/16	10	**(µg/m³)**	**7**	0.051	ND	ND	ND	10.3

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	0.00	1.00
	0.00	1.00
	0.00	1.00
		1.00
24.0	34.75	2.00
23.0	23.00	6.00
1.37	6.06	4.00
--	1.65	1.00
ND	38.45	4.00
--	38.81	4.00
ND	13.10	4.00
--	11.00	4.00
7.65	74.70	5.00
--	30.70	1.00
1.17	33.80	1.00
--	33.80	1.00
0.791	10.90	1.00
--	10.70	1.00
ND	46.10	1.00
--	44.30	1.00
ND	28.60	1.00
--	24.70	1.00
0.076	1.32	5.00
0.062	0.06	6.00
ND	0.72	4.00
--	0.66	4.00
ND	0.55	5.00
--	0.14	1.00
0.301	3.37	5.00
--	3.49	5.00
ND	10.30	5.00

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10/01/16 (collocated)		(μg/m^3)	**7**	--	--	--	--	10.6
10/04/16	**10**	(μg/m^3)	**3**	37.4	1.27	24.9	42.4	26.8
10/04/16 (collocated)		(μg/m^3)	**3**	--	--	--	33.3	--
10/07/16	**10**	(μg/m^3)	**6**	32.8	0.403	1.37	5.77	4.24
10/07/16 (collocated)		(μg/m^3)	**6**		--	--	5.73	--
10/10/16	**10**	(μg/m^3)	**2**	8.49	ND	ND	12.5	8.74
10/10/16 (collocated)		(μg/m^3)	**2**	--	--	--	12.6	--
10/13/16	**10**	(μg/m^3)	**5**	18.8	ND	3.57	1.76	1.27
10/13/16 (collocated)		(μg/m^3)	**5**	--	--	--	1.7	--
10/16/16	**10**	(μg/m^3)	**1**	32.3	ND	ND	25.6	3.33
10/16/16 (collocated)		(μg/m^3)	**1**	31.6	--	--	--	--
10/19/16	**10**	(μg/m^3)	**4**	12.1	ND	1.70	0.232	ND
10/19/16 (collocated)		(μg/m^3)	**4**	11.9	--	--	--	--
10/22/16	**10**	(μg/m^3)	**7**	0.410	ND	ND	ND	13.5
10/22/16 (collocated)		(μg/m^3)	**7**	--	--	--	--	9,.68
10/25/16	**10**	(μg/m^3)	**3**	29.8	57.3	12.0	33.0	67.5
10/25/16 (collocated)		(μg/m^3)	**3**	--	--	--	--	65.3
10/28/16	**10**	**(μg/m3)**	**6**	25.0	ND	0.07	11.1	11.9
10/28/16 (collocated)		**(μg/m3)**	**6**	--	--	--	11.9	--
10/31/16	**10**	**(μg/m3)**	**2**	5.04	17.5	16.2	1.96	29.6
10/31/16 (collocated)		**(μg/m3)**	**2**	--	--	--	1.99	--
11/03/16	**11**	**(μg/m3)**	**5**	18.8	ND	ND	66.4	2.30
11/03/16 (collocated)		**(μg/m3)**	**5**	18.9	--	--	--	--
11/06/16	**11**	**(μg/m3)**	**1**	32.6	0.54	0.102	28.9	3.12
11/06/16 (collocated)		**(μg/m3)**	**1**	35.1	--	--	--	--
11/09/16	**11**	**(μg/m3)**	**4**	0.921	ND	ND	16.4	ND
11/09/16 (collocated)		**(μg/m3)**	**4**	--	--	--	17.3	--
11/12/16	**11**	**(μg/m3)**	**7**	0.221	ND	15.1	2.22	ND
11/12/16 (collocated)		**(μg/m3)**	**7**	--	--	--	2.13	--
11/15/16	**11**	**(μg/m3)**	**3**	ND	106	0.268	ND	54.8
11/15/16 (collocated)		**(μg/m3)**	**3**	--	--	--	ND	--
11/18/16	**11**	**(μg/m3)**	**6**	16.9	0.827	3.61	23.4	0.210
11/18/16 (collocated)		**(μg/m3)**	**6**	--	--	3.40	--	--
11/21/16	**11**	**(μg/m3)**	**2**	8.27	153	0.388	1.60	147
11/21/16 (collocated)		**(μg/m3)**	**2**	--	--	--	1.61	--

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--	10.55	5.00
6.06	42.40	4.00
--	33.30	4.00
0.704	32.80	1.00
--	5.73	4.00
ND	12.50	4.00
--	12.60	4.00
0.258	18.80	1.00
--	1.70	4.00
ND	32.30	1.00
--	31.60	1.00
ND	12.10	1.00
--	11.90	1.00
0.073	13.50	5.00
--	0.00	None
43.5	67.50	5.00
--	65.30	5.00
ND	24.99	1.00
--	11.86	4.00
27.5	29.63	5.00
--	1.99	4.00
ND	66.38	4.00
--	18.90	1.00
0.120	32.64	1.00
--	35.11	1.00
ND	16.36	4.00
--	17.34	4.00
ND	15.09	3.00
--	2.13	4.00
59.8	106.27	2.00
--	0.00	None
0.831	23.40	4.00
--	3.40	3.00
66.7	153.00	2.00
--	1.61	4.00

3

2.81

DENKA Air Monitoring Summary Sheet
May 25 - November 15

2.81

DENKA Air Monitoring Summary Sheet
May 25 - November 15

11/24/16	**11**	(µg/m3)	**5**	2.81	5.66	0.870	1.02	17.1
11/24/16 (collocated)		(µg/m3)	**5**	--	--	--	--	--
11/27/16	**11**	(µg/m3)	**1**	3.74	*0.025*	ND	5.40	4.90
11/27/16 (collocated)		(µg/m3)	**1**	--	--	--	5.08	--
11/30/16	**11**	(µg/m3)	**4**	*0.018*	*0.025*	0.058	*0.025*	0.802
11/30/16 (collocated)		(µg/m3)	**4**	--	--	0.062	--	--

2.81

3.77	17.10	5.00
3.74	3.74	6.00
0.018	5.40	4.00
--	5.08	4.00
0.218	0.80	5.00
--	0.06	3.00

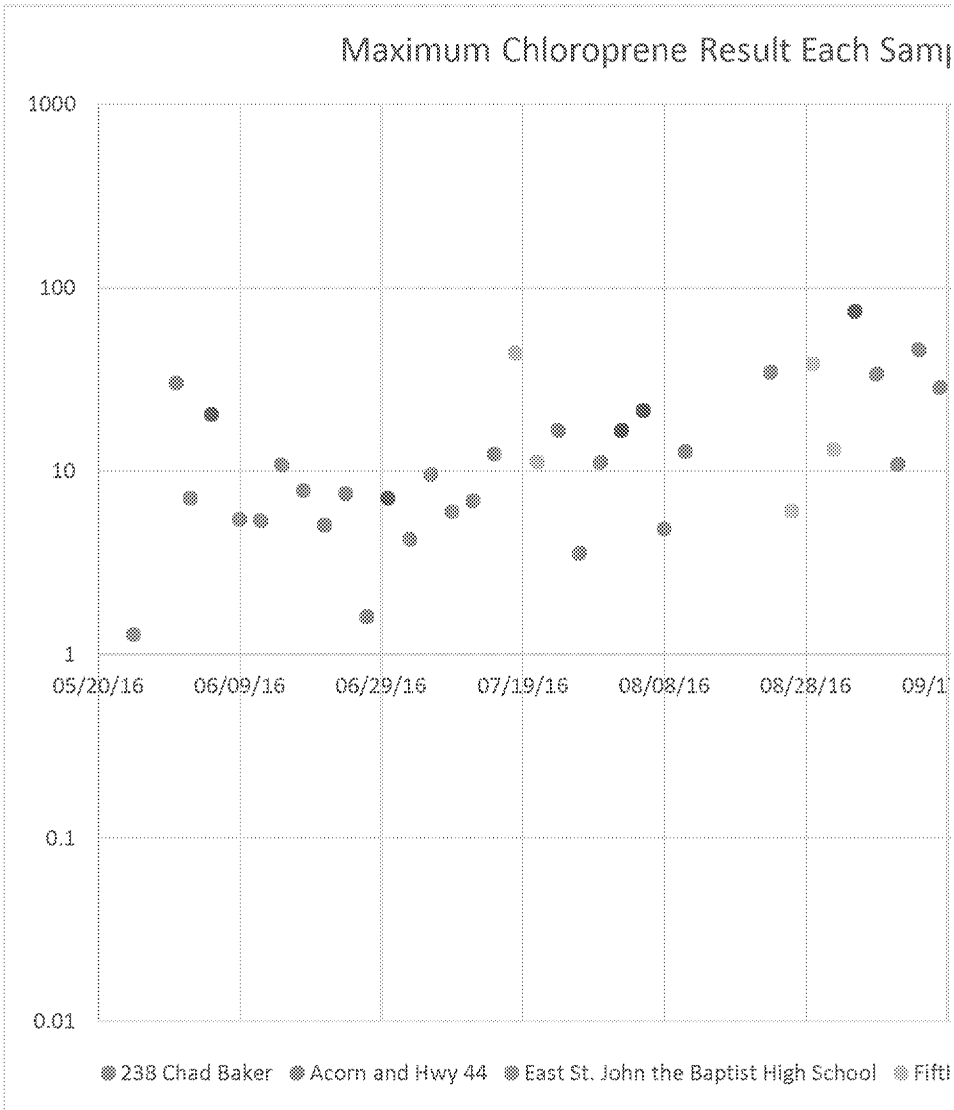
2.81

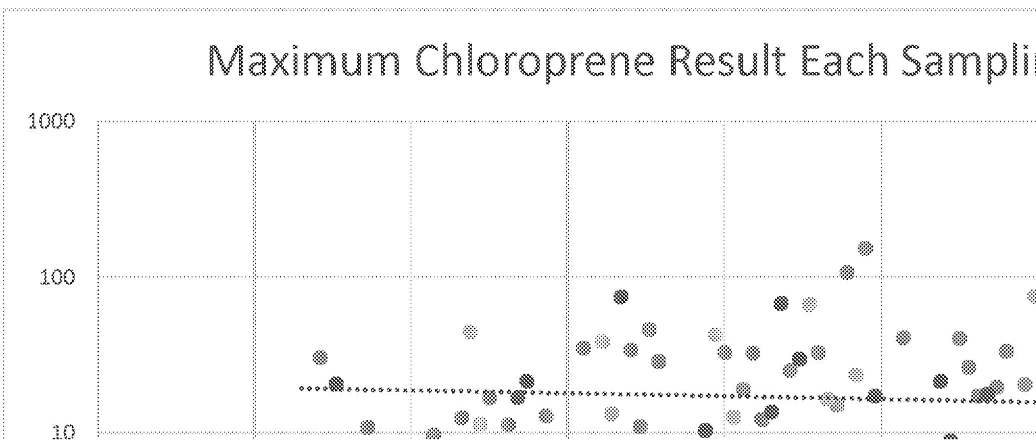
2.81

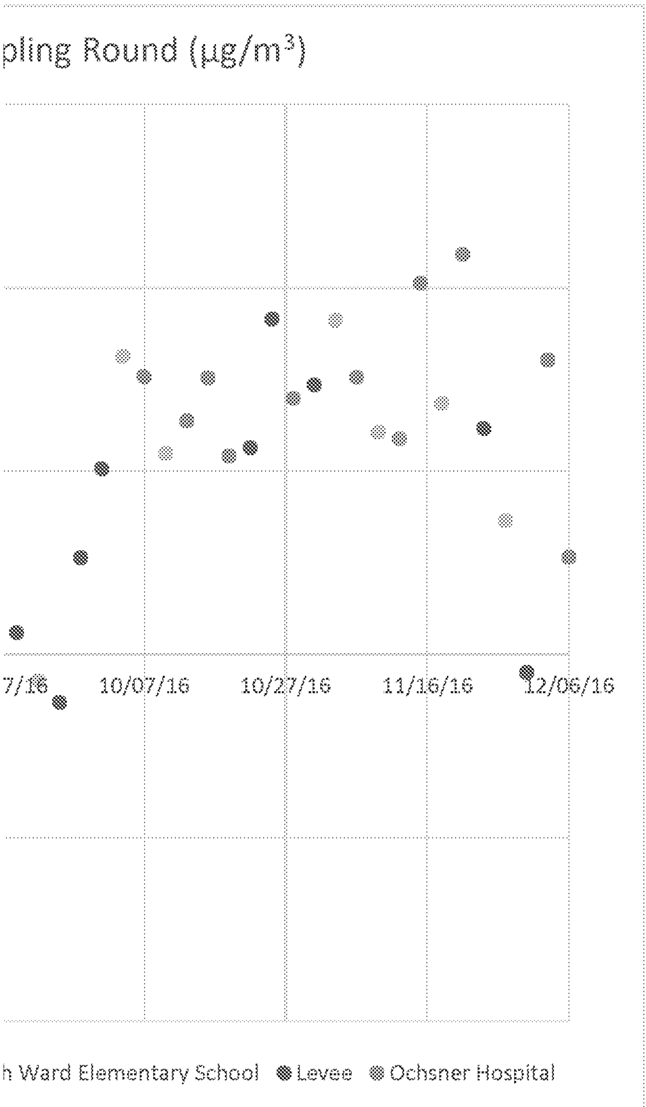
	238 Chad Baker	Acorn and Hwy 44	East St. John the Baptist High School	Fifth Ward Elementary School	Levee	Ochsner Hospital	Sample Round Max
05/25/16		1.291229508					1.29
05/28/16							0.000
05/31/16		30.32213115					30.322
06/02/16	7.145286885						7.145
06/05/16					20.49282787		20.493
06/09/16	5.476844262						5.48
06/12/16	5.368032787						5.368
06/15/16						10.80860656	10.81
06/18/16	7.870696721						7.871
06/21/16	5.078						5.08
06/24/16						7.544	7.54
06/27/16						1.614	1.614
06/30/16					7.145286885		7.15
07/03/16						4.279918033	4.3
07/06/16						9.611680328	9.6
07/09/16						6.020901639	6.0
07/12/16	6.891393443						6.891
07/15/16	12.44077869						12.441
07/18/16				44.25			44.250
07/21/16				11.28012295			11.280
07/24/16	16.72069672						16.72
07/27/16						3.587151639	3.587
07/30/16						11.20758197	11.208
08/02/16					16.75696721		16.757
08/05/16					21.39959016		21.40
08/08/16		4.860245902					4.86
08/11/16		12.80348361					12.80
08/14/16							None
08/17/16							None
08/20/16							None
08/23/16		34.74713115					34.74713115
08/26/16				6.057172131			6.057172131
08/29/16				38.44672131			38.44672131
09/01/16				13.1			13.1
09/04/16					74.7		74.7
09/07/16	33.8						33.8
09/10/16	10.9						10.9
09/13/16	46.1						46.1
09/16/16	28.6						28.6
09/19/16					1.32		1.32
09/22/16				0.721782787			0.721782787
09/25/16					0.547684426		0.547684426
09/28/16					3.365901639		3.365901639
10/01/16					10.30081967		10.30081967
10/04/16				42.4			42.4
10/07/16	32.8						32.8
10/10/16				12.5			12.5
10/13/16	18.8						18.8
10/16/16	32.3						32.3

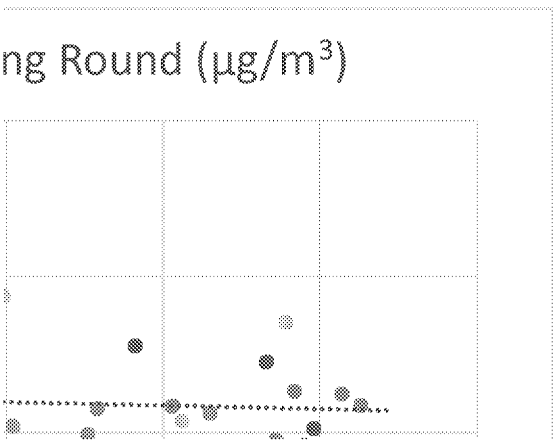
Max Site	Wind Speed	238 Chad Baker	Acorn and Hwy 44	East St. John the Baptist High School	Fifth Ward Elementa ry School
		ND	1.291229508	0.830594262	ND
None		--	Invalid	Invalid	--
2.00		7.580532787	30.32213115	2.016639344	3.07
1.00	3.17	7.145286885	0.072540984	2.665881148	1.88
5.00	2.59	11.09877049	ND	0.340942623	4.97
1.000	2.93	5.476844262	0.623852459	1.251331967	3.41
1.00	2.36	5.368032787	0.982930328	5.150409836	0.57
6.000	2.84	1.211434426	0.224877049	1.069979508	1.74
1.000	2.91	7.870696721	4.388729508	0.268401639	1.89
1.00	2.52	5.078	ND	1.037	1.30
1.000	2.20	0.305	6.819	0.029 U	ND
6.00	2.43	0.163	1.193	0.417	ND
5.00	2.41	4.533811475	ND	0.35182377	3.50
6.00	2.45	ND	0.054405738	1.693831967	ND
6.000	3.70	ND	ND	0.119692623	ND
6.0	2.59	1.708340164	4.751434426	0.761680328	0.34
1.00	2.39	6.891393443	1.225942623	2.364836066	5.62
1.000	2.59	12.44077869	0.881372951	0.914016393	3.63
4.000	2.21	36.99590164	ND	0.275655738	44.25
4.000	2.47	5.005327869	1.182418033	2.12182377	11.28
1.0	2.25	16.72069672	9.067622951	8.160860656	8.09
6.000	4.10	ND	1.708340164	0.195860656	ND
6.000	2.21	2.488155738	5.295491803	2.669508197	3.15
5.00	2.38	0.253893443	0.881372951	1.864303279	10.34
5.00	2.19	5.83954918	12.47704918	2.386598361	8.67
2.00	3.54	0.417110656	4.860245902	1.628545082	0.57
2.00	2.95	ND	12.80348361	ND	ND
None	2.01	Invalid	Invalid	Invalid	Invalid
None				No Samples Collected Due to Flooding in the Area	
None				No Samples Collected Due to Flooding in the Area	
2	2.01	5.186680328	34.74713115	8.559836066	--
4	3.21	1.610409836	0.467889344	0.301045082	6.06
4	3.59	25.60696721	ND	0.627479508	38.45
4	3.16	0.798	ND	ND	13.10
5	1.84	31	39.2	10.2	34.70
1	2.35	33.8	2.21	2.17	3.44
1	2.26	10.9	0.16	4.9	6.27
1	3.76	46.1	ND	0.12	16.10
1	3.12	28.6	ND	0.921	0.69
5	2.38	ND	0.105	0.033	ND
4	2.42	0.362704918	ND	0.065286885	0.72
5	1.99	0.108811475	0.072540984	0.126946721	0.11
5	2.06	0.072540984	0.431618852	0.050778689	0.55
5	2.09	0.050778689	ND	ND	ND
4	3.13	37.4	1.27	24.9	42.40
1	3.03	32.8	0.403	1.37	5.77
4	2.72	8.49	ND	ND	12.50
1	2.91	18.8	ND	3.57	1.76
1	2.88	32.3	ND	ND	25.60

Levee	Ochsner Hospital
ND	ND
Invalid	--
6.13	17.48
2.64	0.08
20.49	0.81
4.93	4.679
0.27	1.276721311
0.37	10.81
2.70	3.0
0.41	0.69
0.32	7.544
0.04	1.614
7.15	ND
ND	4.28
ND	9.6
1.88	6.0
0.72	0.2
6.46	1.5
1.70	ND
4.90	1.059
9.47	10.0
ND	3.59
6.35	11.2
16.76	6.565
21.40	5.5
2.77	0.8
0.65	2.426
Invalid	Invalid
--	23.97479508
2.23	1.374651639
0.07	ND
8.09	ND
74.70	7.65
2.14	1.17
2.53	0.791
0.23	ND
ND	ND
1.32	0.076
0.18	ND
0.55	ND
3.37	0.301045082
10.30	ND
26.80	6.06
4.24	0.704
8.74	ND
1.27	0.258
3.33	ND





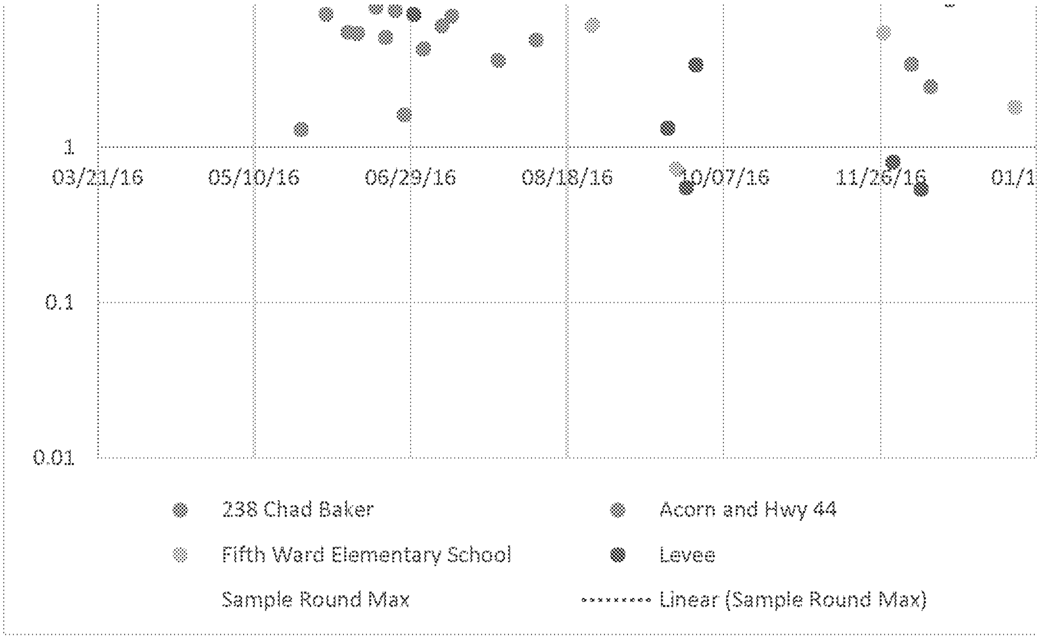

pling Round (µg/m³)
7/16
10/07/16
10/27/16
11/16/16
12/06/16
h Ward Elementary School
Levee
Ochsner Hospital

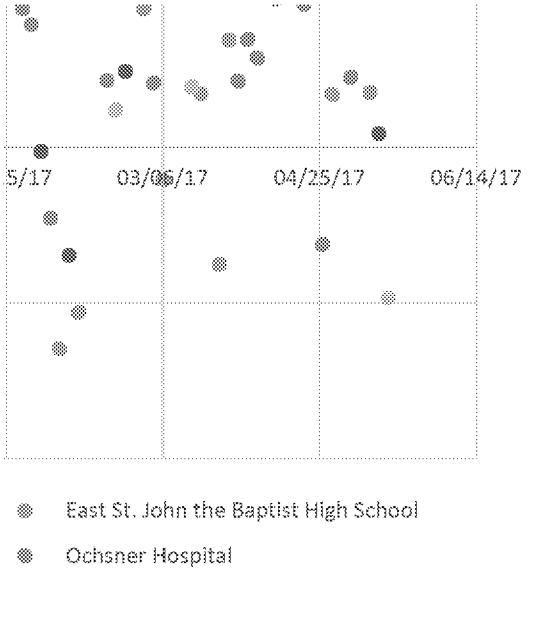

ng Round (µg/m³)

10/19/16	12.1						12.1
10/22/16					13.5		13.5
10/25/16					67.5		67.5
10/28/16	24.99036885						24.99036885
10/31/16					29.6329918		29.6329918
11/03/16				66.375			66.375
11/06/16	32.64344262						32.64344262
11/09/16				16.3579918			16.3579918
11/12/16			15.08852459				15.08852459
11/15/16		106.272541					106.272541
11/18/16				23.4			23.4
11/21/16		153					153
11/24/16					17.1		17.1
11/27/16				5.4			5.4
11/30/16					0.802		0.802
12/03/16	40.6						40.6
12/06/16		3.41					3.41
12/09/16					0.537		0.537
12/12/16						2.44	2.44
12/15/16					21.3		21.3
12/18/16					8.81		8.81
12/21/16	40.3						40.3
12/24/16	26.2						26.2
12/27/16	17.1						17.1
12/30/16					17.6		17.6
01/02/17	19.5						19.5
01/05/17	33.2						33.2
01/08/17				1.81			1.81
01/11/17			20.3				20.3
01/14/17				75.1			75.1
01/17/17			11				11
01/20/17		7.76					7.76
01/23/17		6.09					6.09
01/26/17					0.939		0.939
01/29/17		0.352					0.352
02/01/17			0.051				0.051
02/04/17					0.203		0.203
02/07/17			0.087				0.087
02/10/17						9.68	9.68
02/13/17		14.2					14.2
02/16/17		2.69					2.69
02/19/17				1.74			1.74
02/22/17					3.06		3.06
02/25/17					35.80		35.8
02/28/17			7.76				7.76
03/03/17	2.58						2.58
03/06/17			0.62				0.62
03/09/17	14.8						14.8
03/12/17				11.90			11.9
03/15/17				2.44			2.44
03/18/17			2.21				2.21
03/21/17						13.3	13.3
03/24/17			0.178				0.178
03/27/17			4.86				4.86
03/30/17	2.67						2.67

1	2.83	12.1	ND	1.7	0.23
5	4.03	0.41	ND	ND	ND
5	1.66	29.8	57.3	12	33.00
1	3.72	24.99036885	ND	0.072540984	11.14
5	2.06	5.041598361	17.51864754	16.24918033	1.96
4	3.04	18.82438525	ND	ND	66.38
1	2.57	32.64344262	0.536803279	0.101557377	28.91
4	5.76	0.921270492	ND	ND	16.36
3	1.69	0.22125	ND	15.08852459	2.22
2	1.52	ND	106.272541	0.268401639	ND
4	2.83	16.9	0.827	3.61	23.40
2	1.38	8.27	153	0.388	1.60
5	2.51	2.81	5.66	0.87	1.02
4	2.48	3.74	0.025	ND	5.40
5	3.60	0.018	0.025	0.058	0.03
1	1.85				
2	1.69				
5	2.69				
6	1.80				
5	1.73				
5	3.26				
1	0.52				
1	0.65				
1	8.01				
5	10.37				
1	4.06				
1	2.53				
4	4.43				
3	4.70				
4	2.53				
3	3.56				
2	3.73				
2	9.75				
5	5.16				
2	3.96				
	4.38				
	4.78				
	5.54				
	3.95				
	3.54				
	3.22				
	3.10				
	2.47				
	3.83				
	6.06				
	4.91				
	5.39				
	2.77				
	4.77				
	3.73				
	3.70				
	2.92				
	5.00				
	4.54				
	4.45				

ND	ND
13.50	0.073
67.50	43.5
11.93	ND
29.63	27.52930328
2.30	ND
3.12	0.119692623
ND	ND
ND	ND
54.77	59.84631148
0.21	0.831
147.00	66.7
17.10	3.77
4.90	0.018
0.80	0.218




5/17
03/06/17
04/25/17
06/14/17
East St. John the Baptist High School
Ochsner Hospital

04/02/17	4.9						4.9
04/05/17						3.74	3.74
04/08/17					28.30		28.3
04/11/17	8.96						8.96
04/14/17				51.10			51.1
04/17/17	18.4						18.4
04/20/17	8.27						8.27
04/23/17					10.60		10.6
04/26/17						0.239	0.239
04/29/17			2.19				2.19
05/02/17						17.6	17.6
05/05/17		2.81					2.81
05/08/17						14.9	14.9
05/11/17			2.25				2.25
05/14/17					1.22		1.22
05/17/17				0.109			0.109
05/20/17				0.025			0.025
05/23/17	0.098						0.098
05/26/17						0.163	0.163

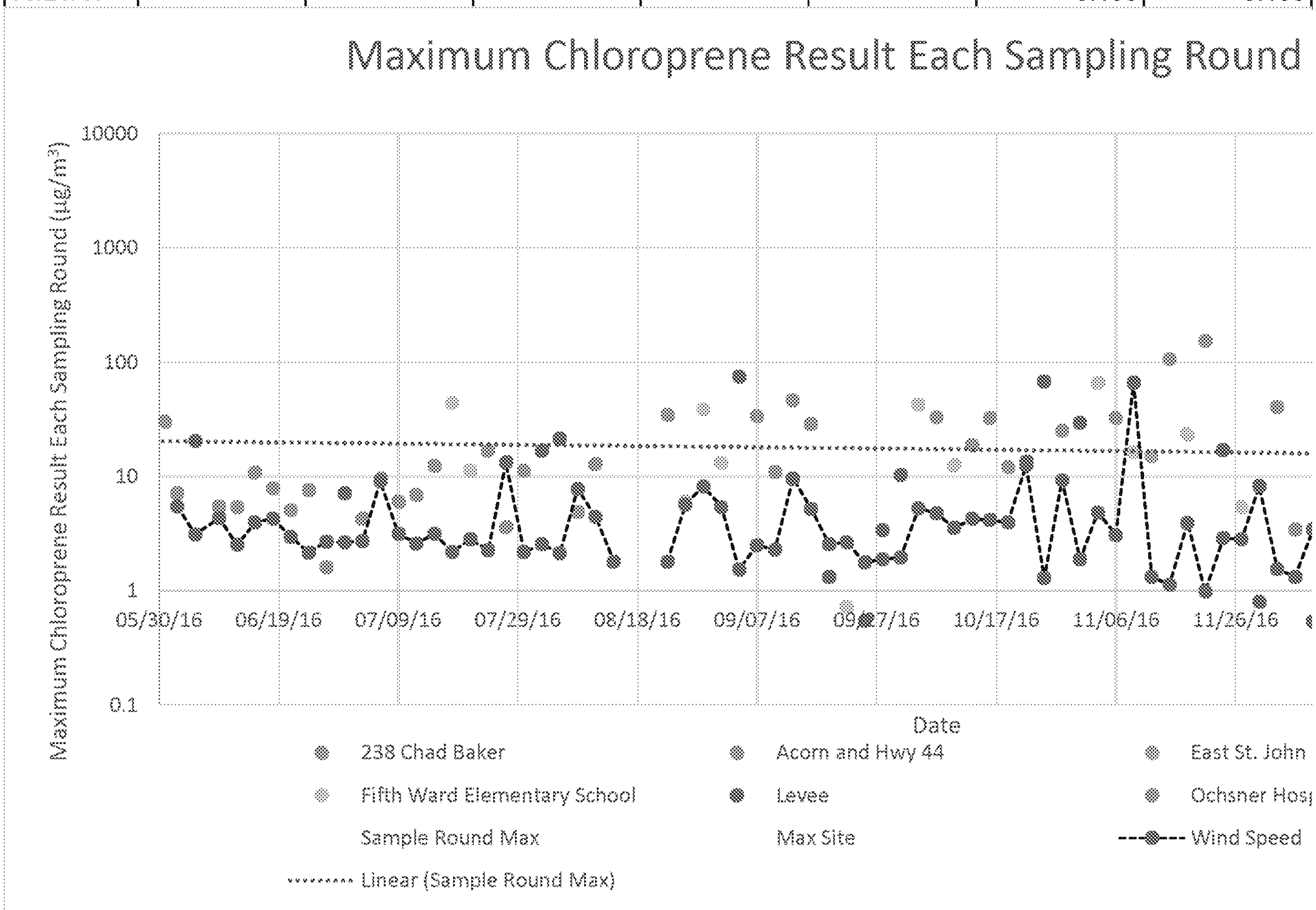
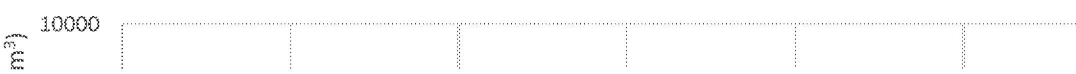
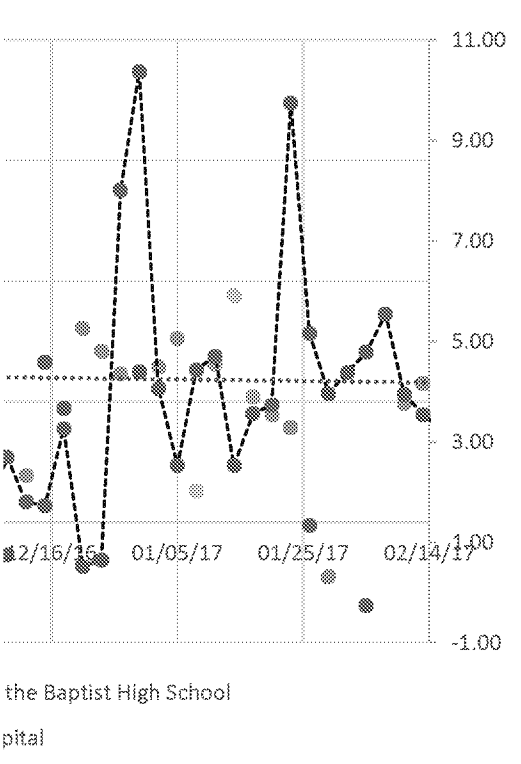


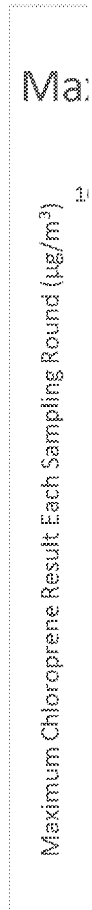
Figure 2. Maximum Chloroprene Result Each Sampling R



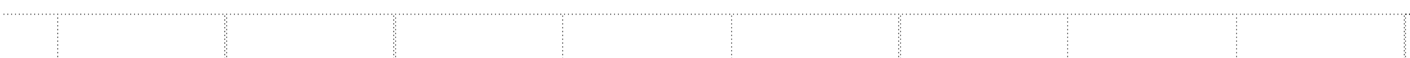
	4.47
	4.24
	2.66
	2.88
	3.11
	2.49
	3.89
	3.73
	5.14
	6.89
	2.15
	6.68
	2.27
	2.98
	2.81
	4.56
	3.99
	3.94
	4.06

(µg/m³)





ound (ug/m³) vs Wind Speed (mph)



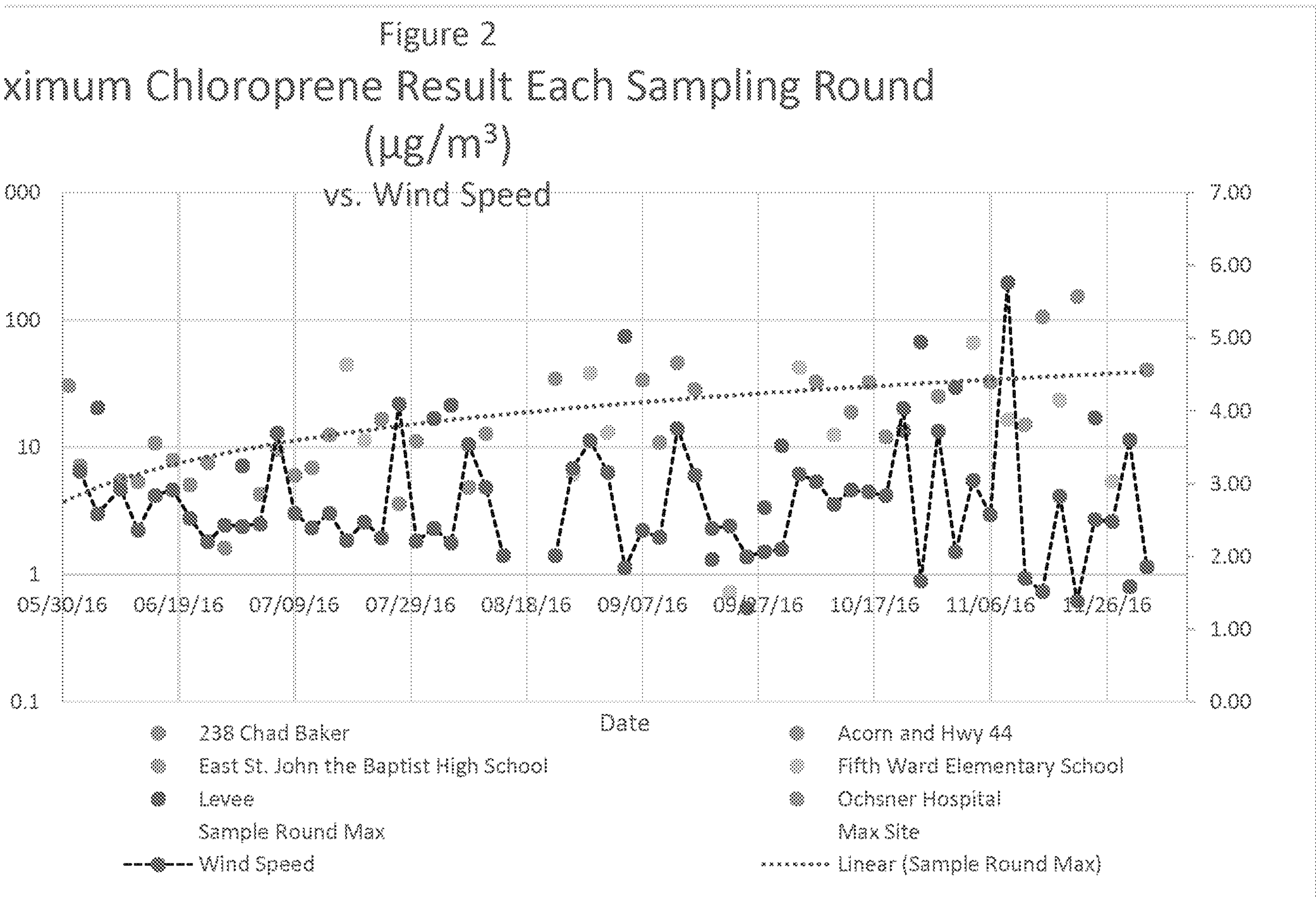
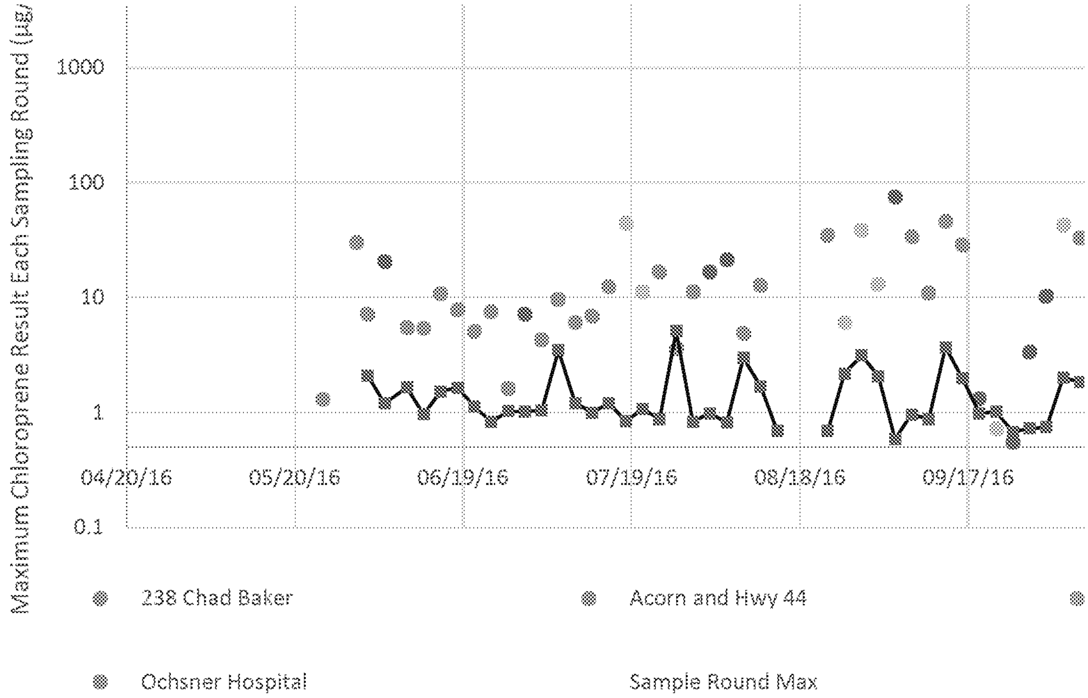


Figure 2
ximum Chloroprene Result Each Sampling Round
(µg/m³)
vs. Wind Speed
000
100
10
1
0.1
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
05/30/16
06/19/16
07/09/16
07/29/16
08/18/16
09/07/16
09/27/16
10/17/16
11/06/16
11/26/16
Date
238 Chad Baker
Acorn and Hwy 44
East St. John the Baptist High School
Fifth Ward Elementary School
Levee
Ochsner Hospital
Sample Round Max
Max Site
Wind Speed
Linear (Sample Round Max)

12.00


Maximum Chloroprene Result Each Sampling Round (µg/
1000
100
10
1
0.1
04/20/16
05/20/16
06/19/16
07/19/16
08/18/16
09/17/16
238 Chad Baker
Acorn and Hwy 44
Ochsner Hospital
Sample Round Max

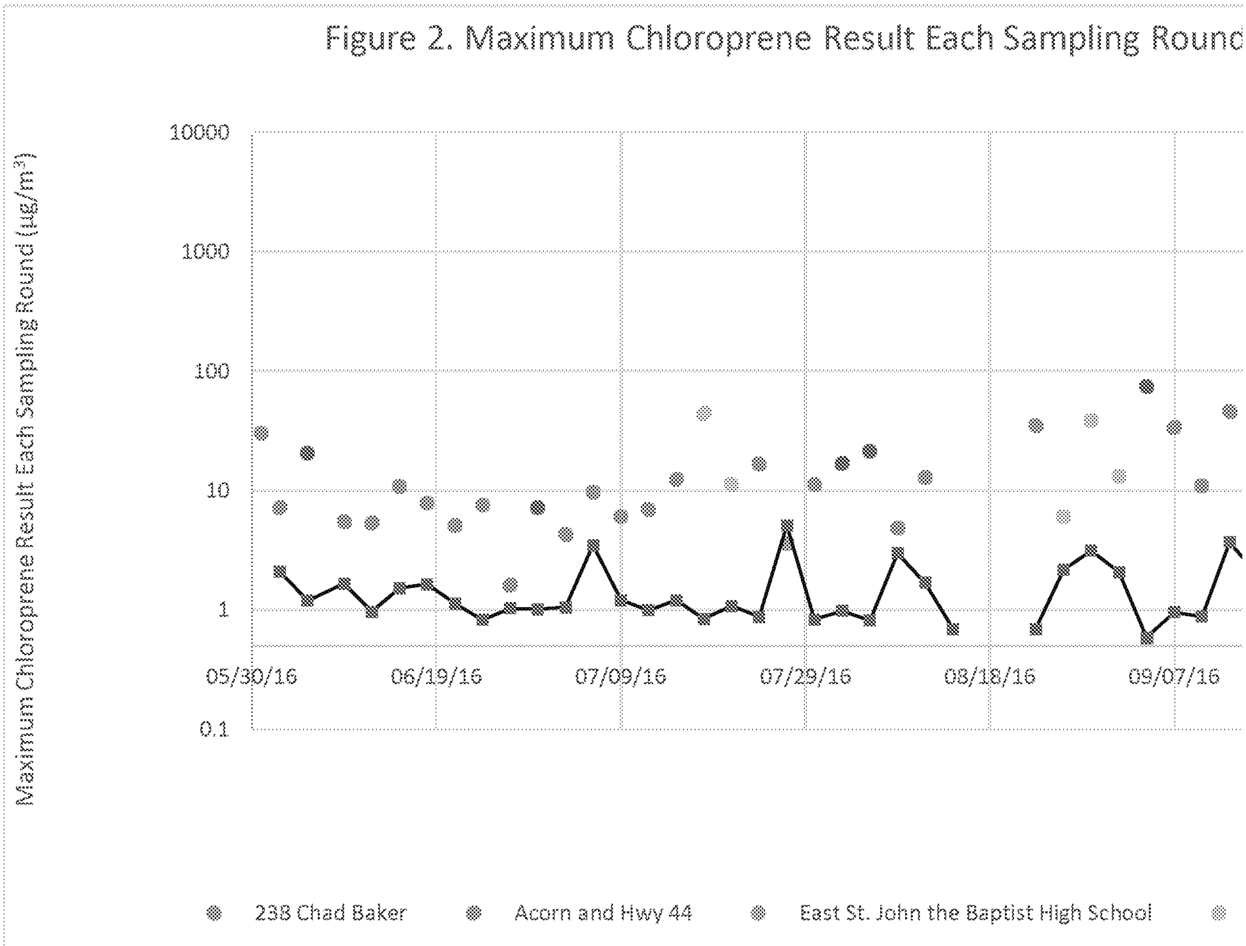
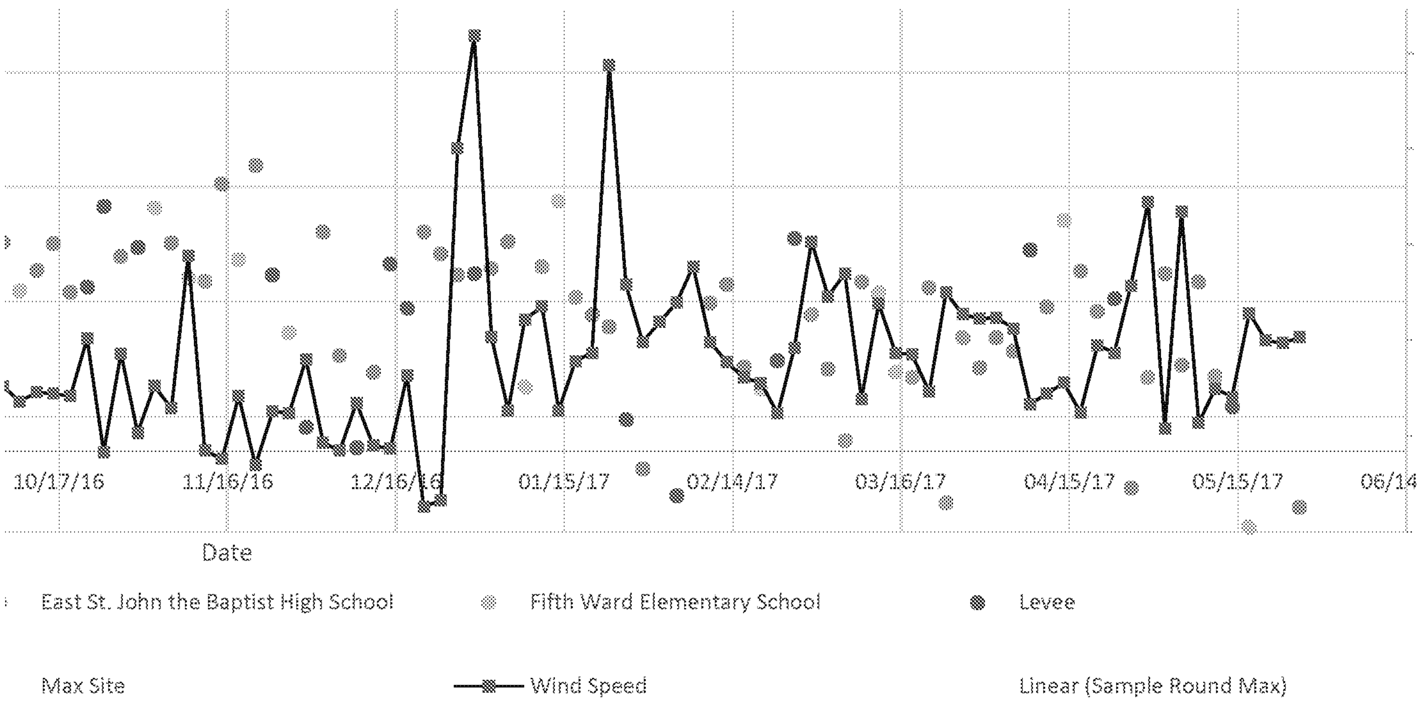
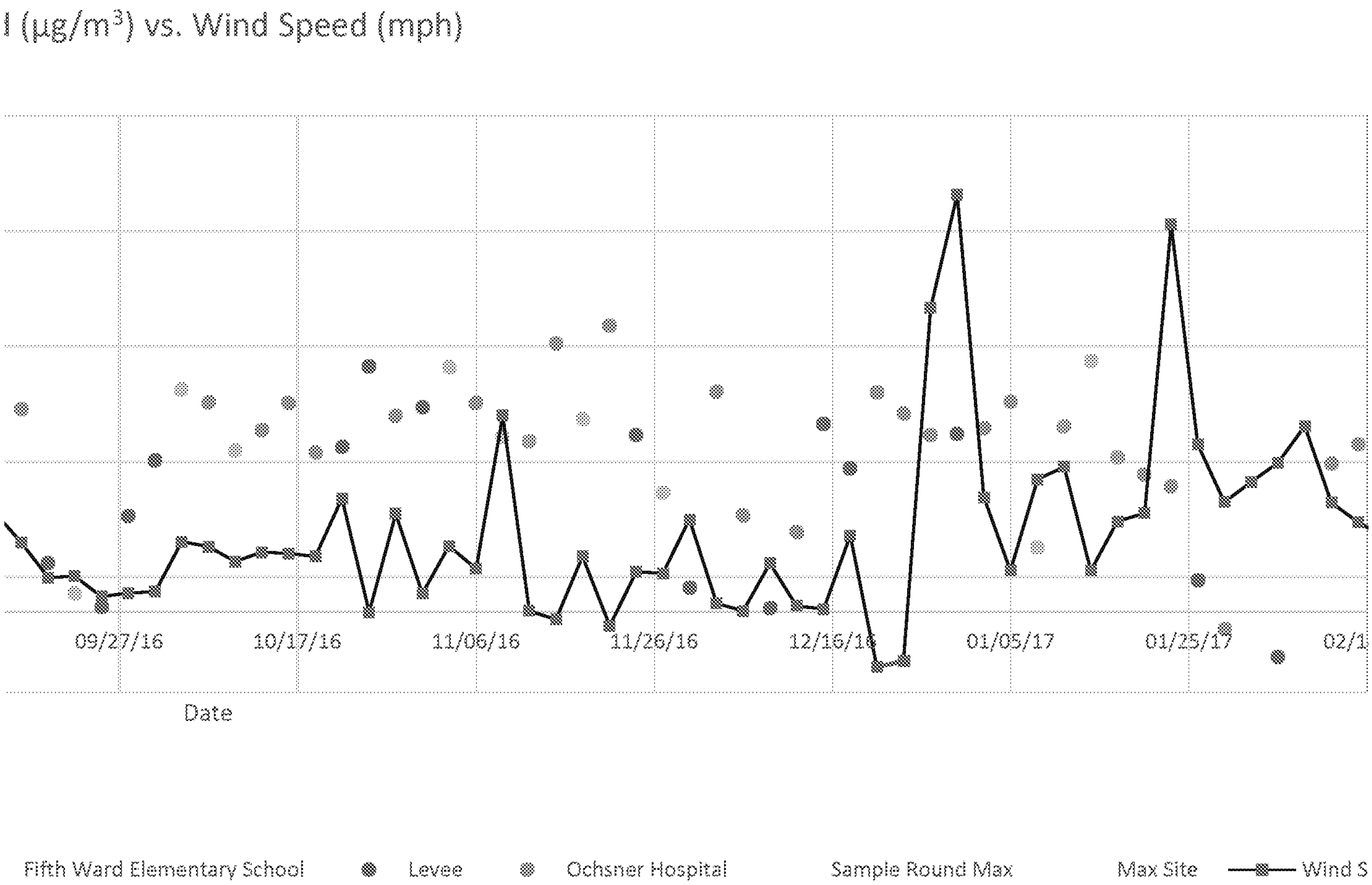
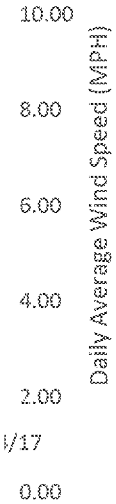
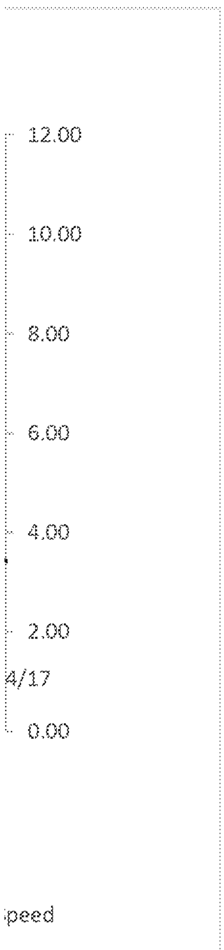


Figure 2. Maximum Chloroprene Result Each Sampling Round
Maximum Chloroprene Result Each Sampling Round (µg/m³)
10000
1000
100
10
1
0.1
05/30/16
06/19/16
07/09/16
07/29/16
08/18/16
09/07/16
238 Chad Baker
Acorn and Hwy 44
East St. John the Baptist High School


10/17/16
11/16/16
12/16/16
01/15/17
02/14/17
03/16/17
04/15/17
05/15/17
06/14
Date
East St. John the Baptist High School
Fifth Ward Elementary School
Levee
Max Site
Wind Speed
Linear (Sample Round Max)


(μg/m³) vs. Wind Speed (mph)
09/27/16
10/17/16
11/06/16
11/26/16
12/16/16
01/05/17
01/25/17
Date
Fifth Ward Elementary School
Levee
Ochsner Hospital
Sample Round Max
Max Site
Wind S


10.00
8.00
6.00
4.00
2.00
0.00
Daily Average Wind Speed (MPH)
/17


12.00
10.00
8.00
6.00
4.00
2.00
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4/17
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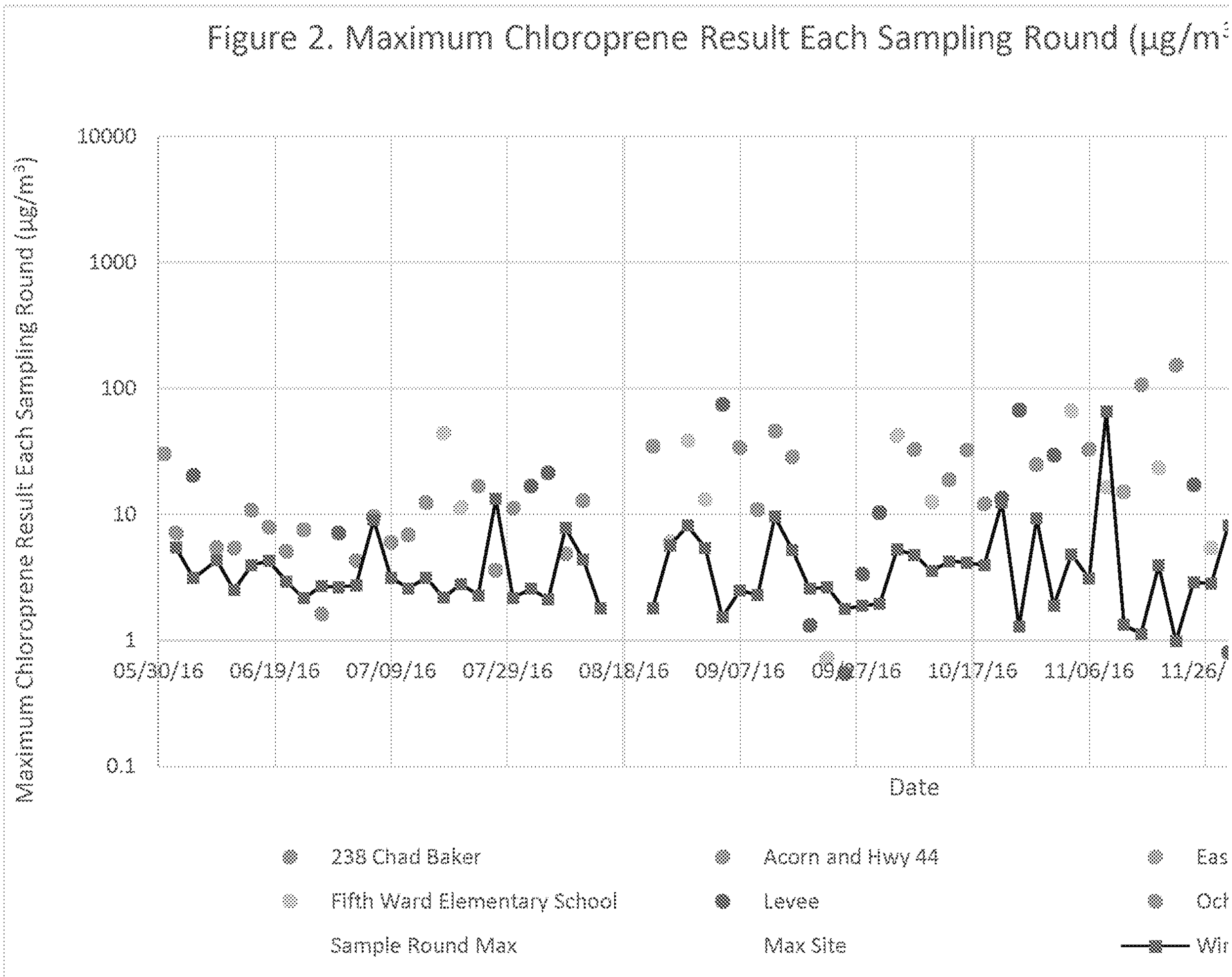
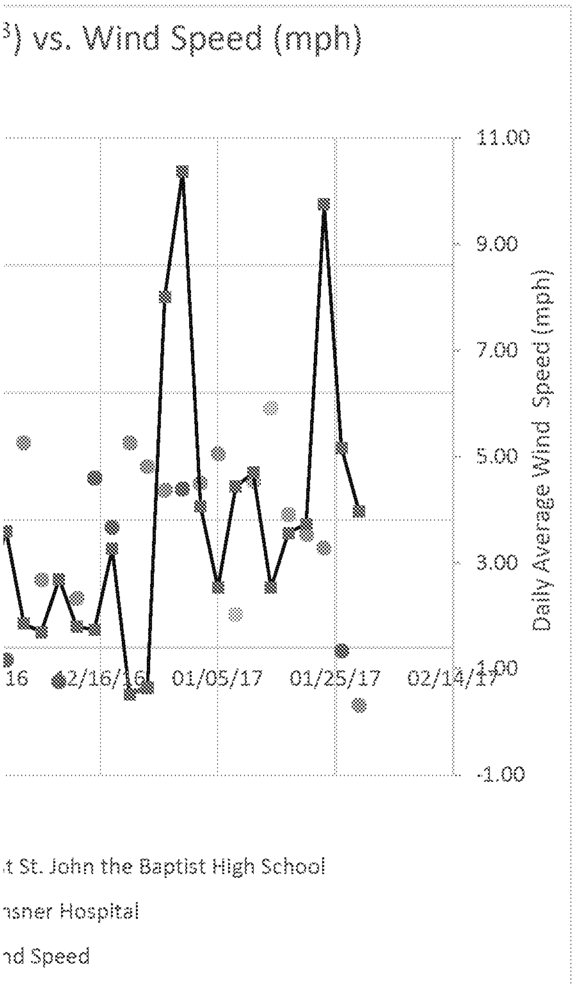


Figure 2. Maximum Chloroprene Result Each Sampling Round (µg/m
Maximum Chloroprene Result Each Sampling Round (µg/m³)
10000
1000
100
10
1
0.1
05/30/16
06/19/16
07/09/16
07/29/16
08/18/16
09/07/16
09/27/16
10/17/16
11/06/16
11/26/
Date
238 Chad Baker
Acorn and Hwy 44
Eas
Fifth Ward Elementary School
Levee
Och
Sample Round Max
Max Site
Wir


³) vs. Wind Speed (mph)
11.00
9.00
7.00
5.00
3.00
1.00
-1.00
Daily Average Wind Speed (mph)
16
12/16/16
01/05/17
01/25/17
02/14/17
t St. John the Baptist High School
nsner Hospital
nd Speed

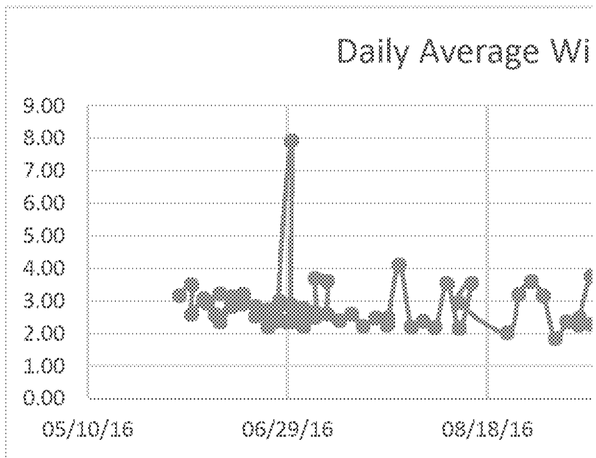
	238 Chad Baker	Acorn and Hwy 44	East St. John the Baptist High School
5/25/16		1.291229508	
5/28/16			
5/31/16		30.32213115	
6/2/16	7.145286885		
6/5/16			
6/9/16	5.476844262		
6/12/16	5.368032787		
6/15/16			
6/18/16	7.870696721		
6/21/16	5.078		
6/24/16			
6/27/16			
6/30/16			
7/3/16			
7/6/16			
7/9/16			
7/12/16	6.891393443		
7/15/16	12.44077869		
7/18/16			
7/21/16			
7/24/16	16.72069672		
7/27/16			
7/30/16			
8/2/16			
8/5/16			
8/8/16		4.860245902	
8/11/16		12.80348361	
8/14/16			
8/17/16			
8/20/16			
8/23/16		34.74713115	
8/26/16			
8/29/16			
9/1/16			
9/4/16			
9/7/16	33.8		
9/10/16	10.9		
9/13/16	46.1		
9/16/16	28.6		
9/19/16			
9/22/16			
9/25/16			
9/28/16			
10/1/16			
10/4/16			
10/7/16	32.8		
10/10/16			
10/13/16	18.8		
10/16/16	32.3		
10/19/16	12.1		
10/22/16			
10/25/16			
10/28/16	24.99036885		
10/31/16			

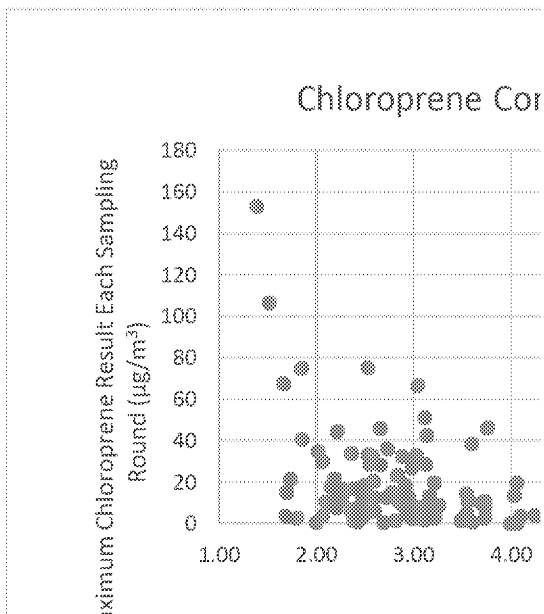
Fifth Ward Elementary School	Levee	Ochsner Hospital	Sample Round Max
			1.291229508
			0
			30.32213115
			7.145286885
	20.49282787		20.49282787
			5.476844262
			5.368032787
		10.80860656	10.80860656
			7.870696721
			5.078
		7.544	7.544
		1.614	1.614
	7.145286885		7.145286885
		4.279918033	4.279918033
		9.611680328	9.611680328
		6.020901639	6.020901639
			6.891393443
			12.44077869
44.25			44.25
11.28012295			11.28012295
			16.72069672
		3.587151639	3.587151639
		11.20758197	11.20758197
	16.75696721		16.75696721
	21.39959016		21.39959016
			4.860245902
			12.80348361
			None
			None
			None
			34.74713115
6.057172131			6.057172131
38.44672131			38.44672131
13.1			13.1
	74.7		74.7
			33.8
			10.9
			46.1
			28.6
	1.32		1.32
0.721782787			0.721782787
	0.547684426		0.547684426
	3.365901639		3.365901639
	10.30081967		10.30081967
42.4			42.4
			32.8
12.5			12.5
			18.8
			32.3
			12.1
	13.5		13.5
	67.5		67.5
			24.99036885
	29.6329918		29.6329918

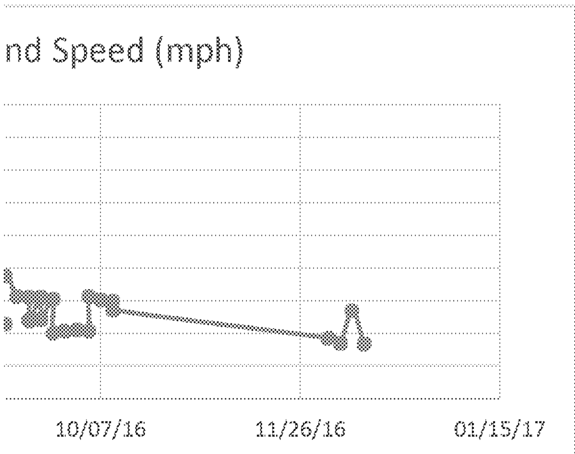
11/3/16				
11/6/16	32.64344262			
11/9/16				
11/12/16				15.08852459
11/15/16		106.272541		
11/18/16				
11/21/16		153		
11/24/16				
11/27/16				
11/30/16				
12/3/16	40.6			
12/6/16		3.41		
12/9/16				
12/12/16				
12/15/16				
12/18/16				
12/21/16	40.3			
12/24/16	26.2			
12/27/16	17.1			
12/30/16				
1/2/17	19.5			
1/5/17	33.2			
1/8/17				
1/11/17				20.3
1/14/17	20			
1/17/17				11
1/20/17		7.76		
1/23/17		6.09		
1/26/17				
1/29/17		0.353		

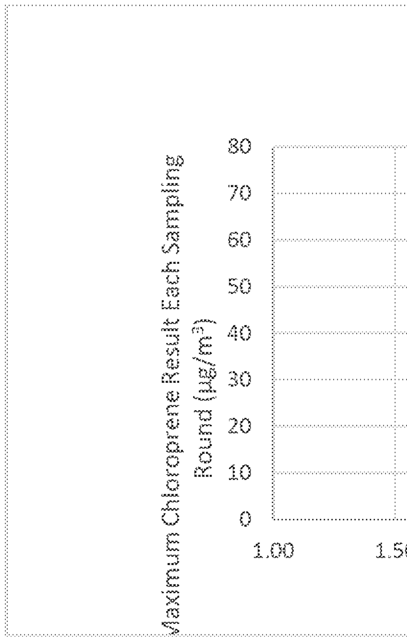
66.375			66.375
			32.64344262
16.3579918			16.3579918
			15.08852459
			106.272541
23.4			23.4
			153
	17.1		17.1
5.4			5.4
	0.802		0.802
			40.6
			3.41
	0.537		0.537
		2.44	2.44
	21.3		21.3
	8.81		8.81
			40.3
			26.2
			17.1
	17.6		17.6
			19.5
			33.2
1.81			1.81
			20.3
			20
			11
			7.76
			6.09
	0.939		0.939
			0.353

DATE	Daily Average Wind Speed (mph)	Sample Round Max
05/25/16		1.291229508
05/31/16		30.32213115
06/02/16	3.17	7.145286885
06/05/16	3.49	1.48
06/05/16	2.59	20.49282787
06/08/16	3.06	7.73
06/11/16	2.57	32.64344262
06/09/16	2.93	5.476844262
06/12/16	3.22	2.57
06/15/16	2.92	13.3
06/12/16	2.36	5.368032787
06/15/16	3.13	5.59
06/15/16	2.84	10.80860656
06/18/16	3.21	19.7
06/18/16	2.91	7.870696721
06/21/16	2.83	12.1
06/24/16	2.55	28.6
06/27/16	2.91	18.8
06/30/16	2.83	23.4
06/21/16	2.52	5.078
06/24/16	2.73	35.9
06/27/16	2.88	32.3
06/30/16	2.81	1.22
07/03/16	2.51	17.1
06/24/16	2.20	7.544
06/27/16	2.98	26.7
06/30/16	2.88	8.96
07/03/16	2.77	14.8
07/06/16	2.49	18.4
06/27/16	2.43	1.614
06/30/16	7.91	4.4
06/30/16	2.41	7.145286885
07/03/16	2.21	13.9
07/03/16	2.45	4.279918033
07/06/16	2.65	45.7
07/06/16	3.70	9.611680328
07/09/16	3.60	0.802
07/09/16	2.59	6.020901639
07/12/16	2.39	6.891393443
07/15/16	2.59	12.44077869
07/18/16	2.21	44.25
07/21/16	2.47	11.28012295
07/24/16	2.47	3.06
07/24/16	2.25	16.72069672
07/27/16	4.10	3.587151639
07/30/16	2.21	11.20758197
08/02/16	2.38	16.75696721
08/05/16	2.19	21.39959016
08/08/16	3.54	4.860245902






nd Speed (mph)
10/07/16
11/26/16
01/15/17


Maximum Chloroprene Result Each Sampling Round (µg/m³)
80
70
60
50
40
30
20
10
0
1.00
1.5(

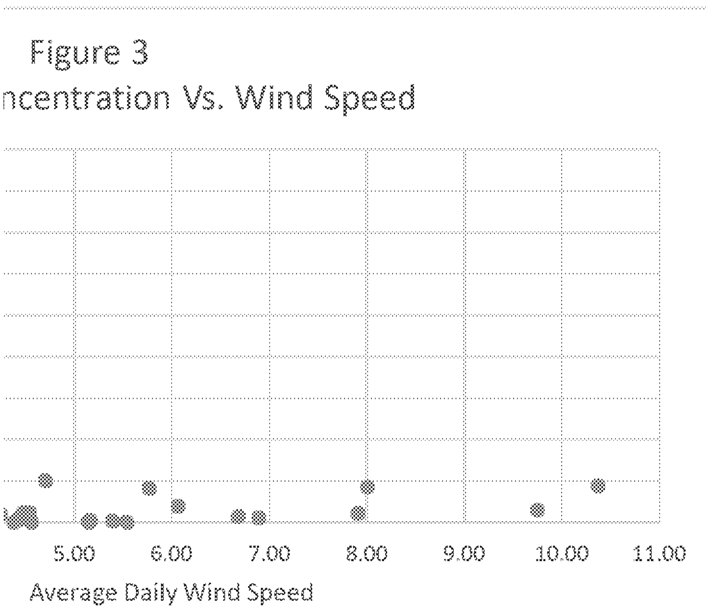
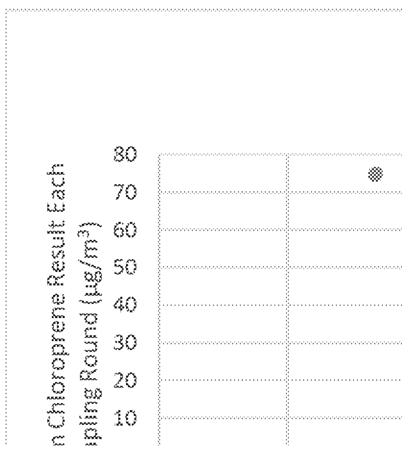


Figure 3
ncentration Vs. Wind Speed
5.00
6.00
7.00
8.00
9.00
10.00
11.00
Average Daily Wind Speed


n Chloroprene Result Each
npling Round (µg/m³)
80
70
60
50
40
30
20
10

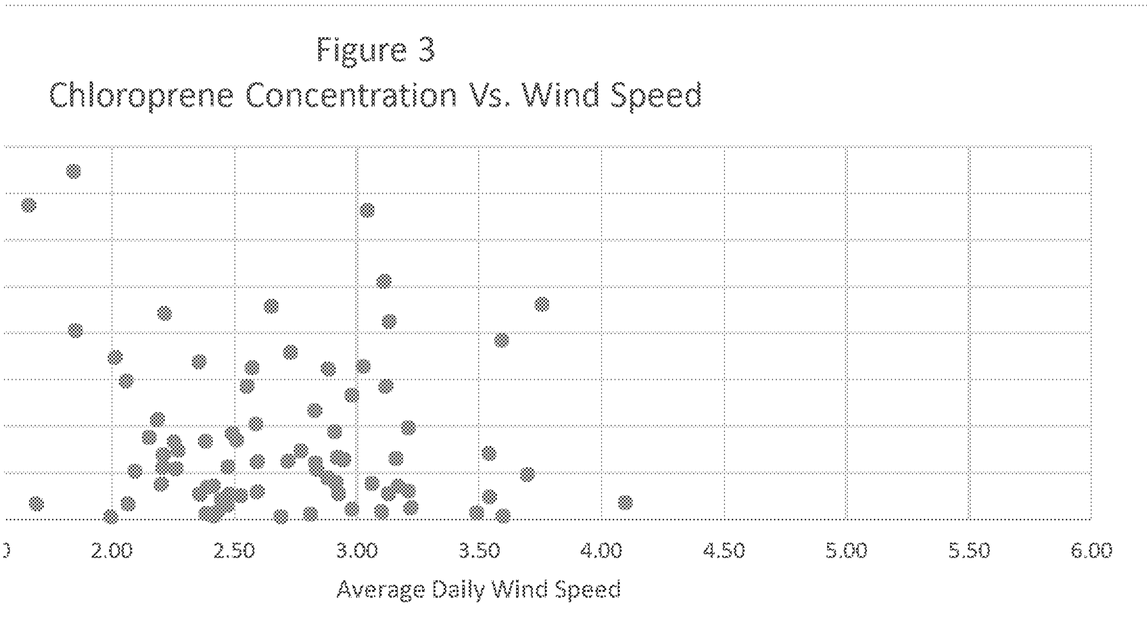


Figure 3
Chloroprene Concentration Vs. Wind Speed
2.00
2.50
3.00
3.50
4.00
4.50
5.00
5.50
6.00
Average Daily Wind Speed

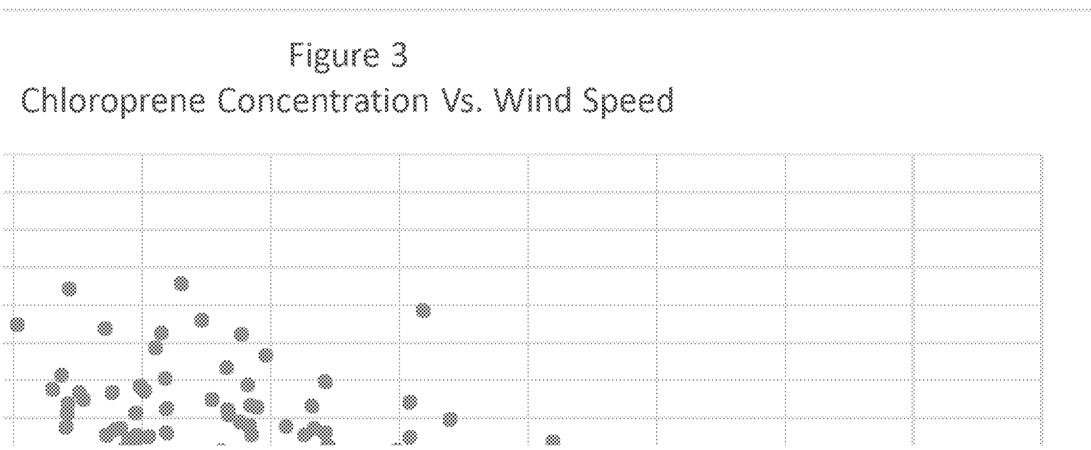
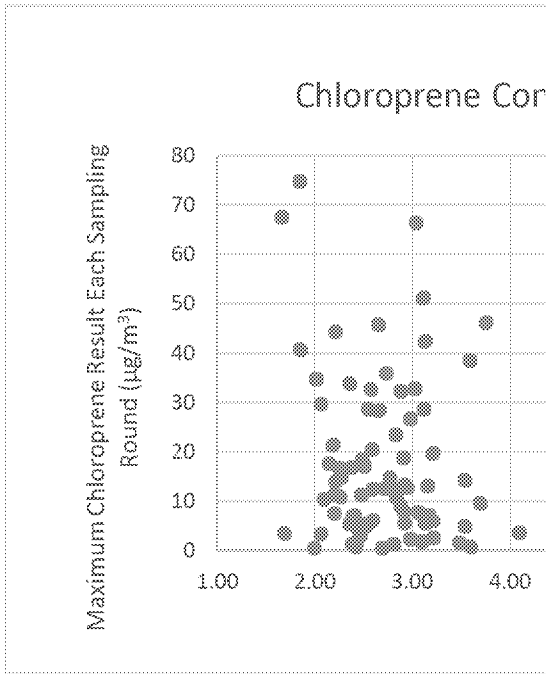
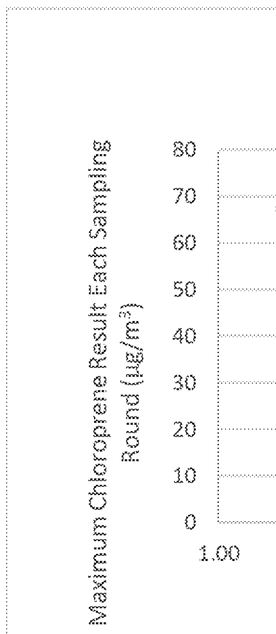
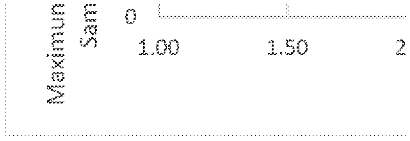


Figure 3
Chloroprene Concentration Vs. Wind Speed

08/11/16	2.15	17.6
08/14/16	3.54	14.2
08/11/16	2.95	12.80348361
08/23/16	2.01	34.74713115
08/26/16	3.21	6.057172131
08/29/16	3.59	38.44672131
09/01/16	3.16	13.1
09/04/16	1.84	74.7
09/07/16	2.35	33.8
09/10/16	2.48	5.4
09/13/16	2.27	14.9
09/10/16	2.26	10.9
09/13/16	3.76	46.1
09/16/16	3.12	28.6
09/19/16	3.11	51.1
09/19/16	2.38	1.32
09/22/16	3.10	1.74
09/22/16	2.42	0.721782787
09/25/16	3.04	66.375
09/25/16	1.99	0.547684426
09/28/16	2.06	3.365901639
10/01/16	2.09	10.30081967
10/04/16	2.06	29.6329918
10/04/16	3.13	42.4
10/07/16	3.03	32.8
10/10/16	2.98	2.25
10/10/16	2.72	12.5
12/03/16	1.85	40.6
12/06/16	1.69	3.41
12/09/16	2.69	0.537
12/12/16	1.66	67.5
12/15/16	2.66	28.3
12/12/16	1.80	2.44
12/15/16	1.52	106.272541
12/15/16	1.73	21.3
12/18/16	1.38	153
12/18/16	3.26	8.81
12/21/16	1.69	15.08852459
12/24/16	3.22	2.69
12/21/16	0.52	40.3
12/24/16	0.65	26.2
12/27/16	8.01	17.1
12/30/16	10.37	17.6
01/02/17	6.89	2.19
01/05/17	6.68	2.81
01/02/17	4.06	19.5
01/05/17	6.06	7.76
01/08/17	4.06	0.163
01/05/17	2.53	33.2
01/08/17	5.76	16.3579918
01/08/17	4.43	1.81
01/11/17	4.03	13.5
01/14/17	5.54	0.087
01/11/17	4.70	20.3






Maximun
Sam
0
1.00
1.50
2

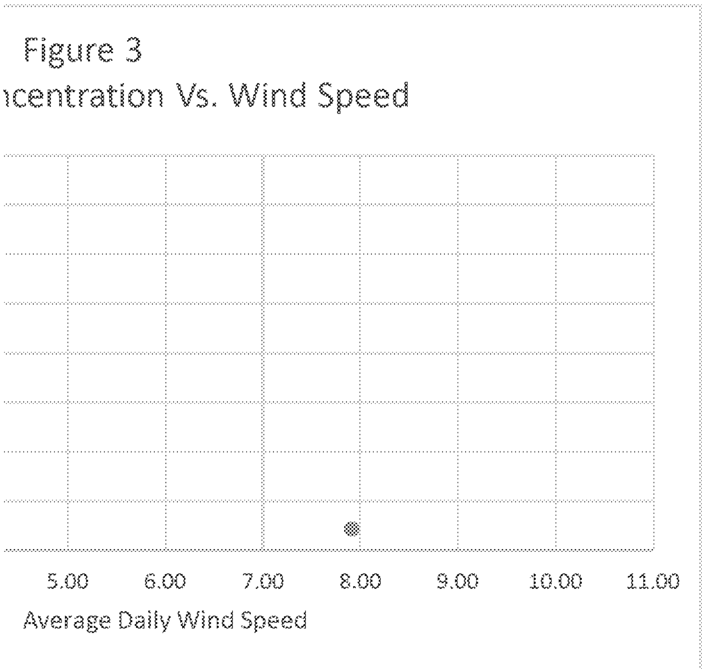
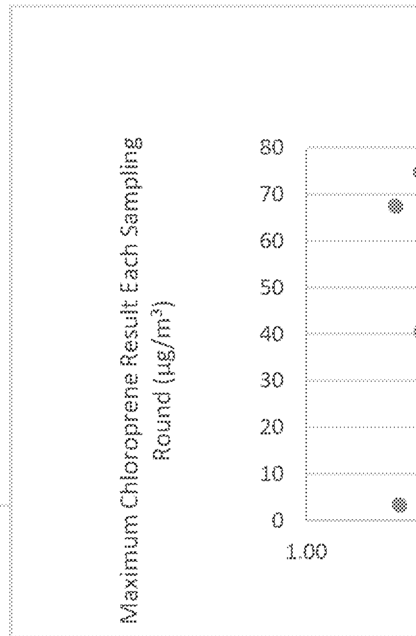


Figure 3
ıcentration Vs. Wind Speed
5.00
6.00
7.00
8.00
9.00
10.00
11.00
Average Daily Wind Speed


Maximum Chloroprene Result Each Sampling Round (µg/m³)
80
70
60
50
40
30
20
10
0
1.00

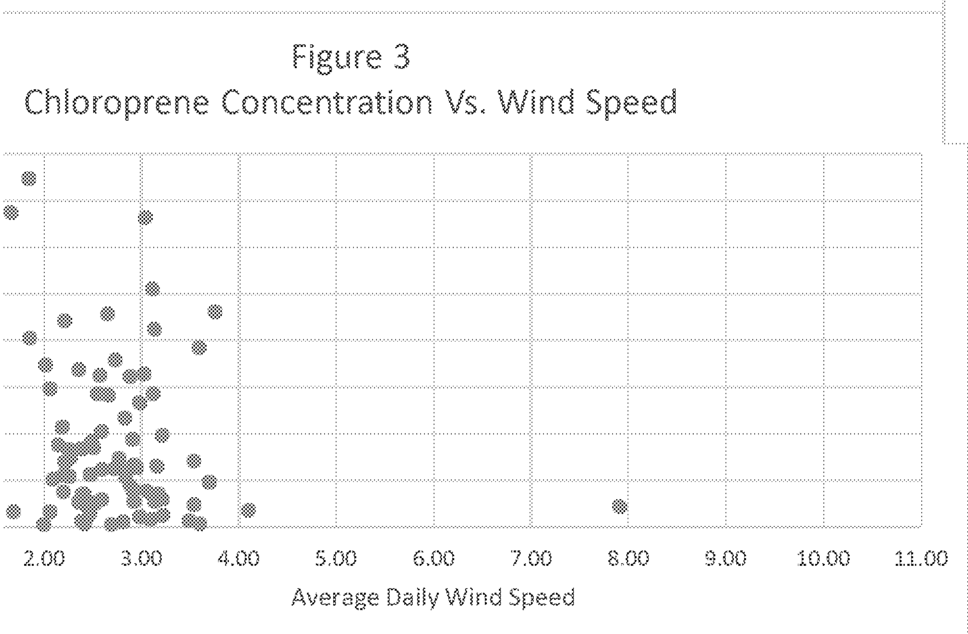
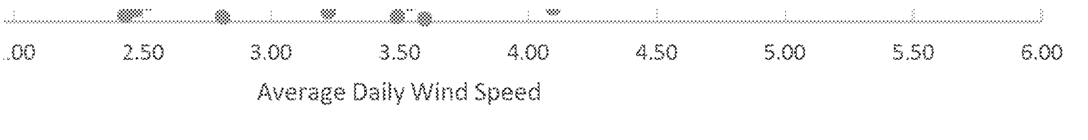
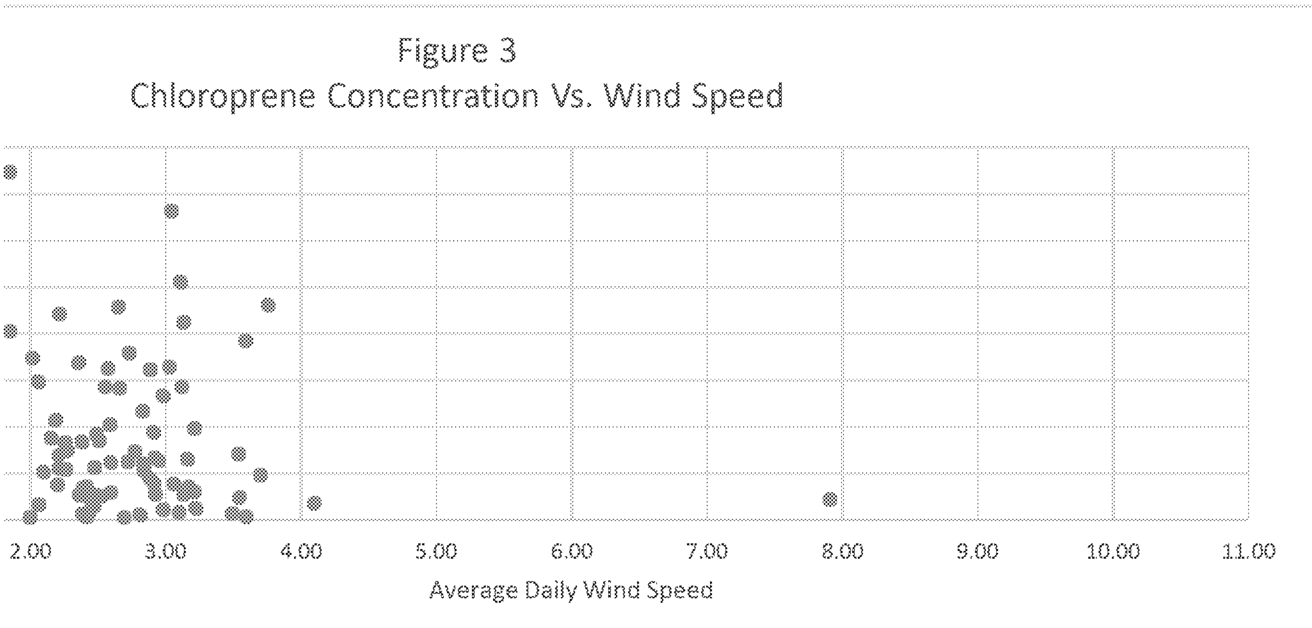


Figure 3
Chloroprene Concentration Vs. Wind Speed
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
Average Daily Wind Speed





Column1		*Column2*	
Mean	2.999609793	Mean	20.90356911
Standard Error	0.178572001	Standard Error	2.77326622
Median	2.590046296	Median	12.6517418
Mode	2.53	Mode	7.145286885
Standard Deviation	1.577105211	Standard Deviation	24.80484715
Sample Variance	2.487260846	Sample Variance	615.2804422
Kurtosis	10.1827306	Kurtosis	10.8755032
Skewness	2.786129503	Skewness	2.847171765
Range	9.85	Range	152.648

01/14/17	4.38	0.051
01/17/17	3.99	0.025
01/20/17	5.39	0.62
01/23/17	4.56	0.109
01/26/17	4.24	3.74
01/14/17	2.53	75.1
01/17/17	4.54	4.86
01/17/17	3.56	11
01/20/17	4.47	4.9
01/20/17	3.73	7.76
01/23/17	9.75	6.09
01/26/17	4.45	2.67
01/29/17	3.73	2.44
01/26/17	5.16	0.939
01/29/17	3.73	10.6
02/01/17	5.14	0.239
01/29/17	3.96	0.352
02/01/17	3.72	24.99036885
02/04/17	5.00	0.178
02/07/17	3.95	9.68
02/10/17	3.70	2.21
02/13/17	4.91	2.58
02/16/17	3.94	0.098
02/19/17	4.78	0.203
02/22/17	3.89	8.27
02/25/17	4.77	11.9
02/28/17	3.83	35.8

Minimum	0.52	Minimum	0.352
Maximum	10.37	Maximum	153
Sum	233.9695638	Sum	1672.285529
Count	78	Count	80
Confidence Level(95.0%)	0.355582282	Confidence Level(95.0%)	5.520048331

Message

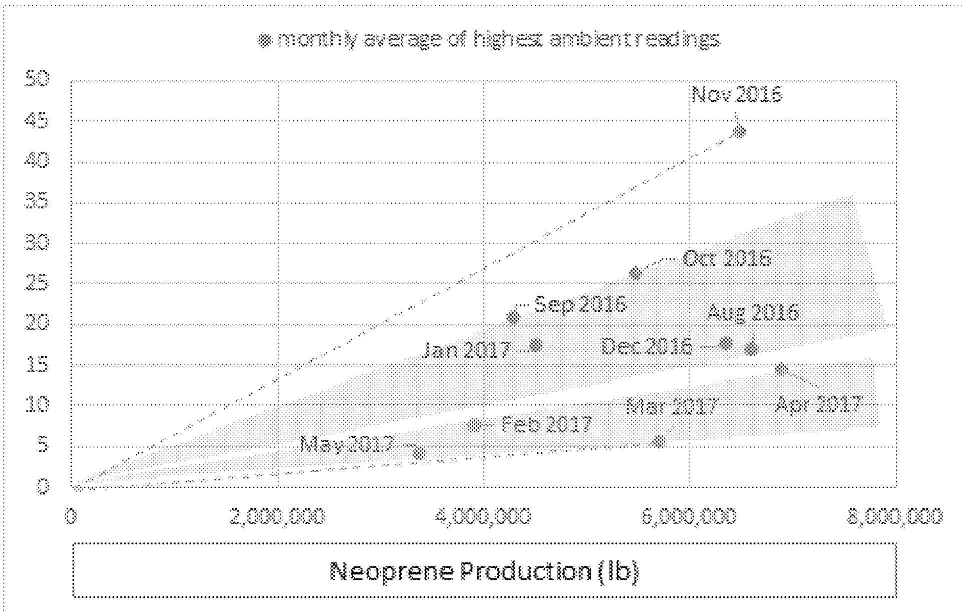
From:	Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent:	8/11/2017 5:37:20 PM
To:	Gregory Langley [Gregory.Langley@LA.GOV]; 'Baileigh Rebowe' [b.rebowe@stjohn-la.gov]
Subject:	RE: informational handout

Greg,

It is looking good. We keep playing with the Questions about the school section. Here is an option for flipping the sentences a bit.

Some LaPlace residents voiced concerns about the risk at the 5th Ward Elementary School, which is near the Denka . Monitoring results from the EPA monitor at this location and available on the EPA website (below) has shown elevated concentrations of chloroprene on some days. The Louisiana Department of Health (LDH) and LDEQ conferenced regarding the environmental status at the school. LDH officials indicated they have found no reason that children cannot attend the school.

Also, you may want to consider using something like this chart (below).



Chloroprene Concentration Compared to Neoprene Production

The graph shows the preliminary results of the ambient air data collected by EPA from August 2016 – May 2017. It suggests that the Denka actions to include installing a condenser unit in February 2017, are effectively working to reduce chloroprene emissions. While it is only for a limited period of time, the data suggests there may have been a reduction in ambient air concentrations of chloroprene measured since February 2017.

From: Gregory Langley [mailto:Gregory.Langley@LA.GOV]
Sent: Friday, August 11, 2017 11:12 AM

To: Gray, David <gray.david@epa.gov>; 'Baileigh Rebowe' <b.rebowe@stjohn-la.gov>
Subject: informational handout

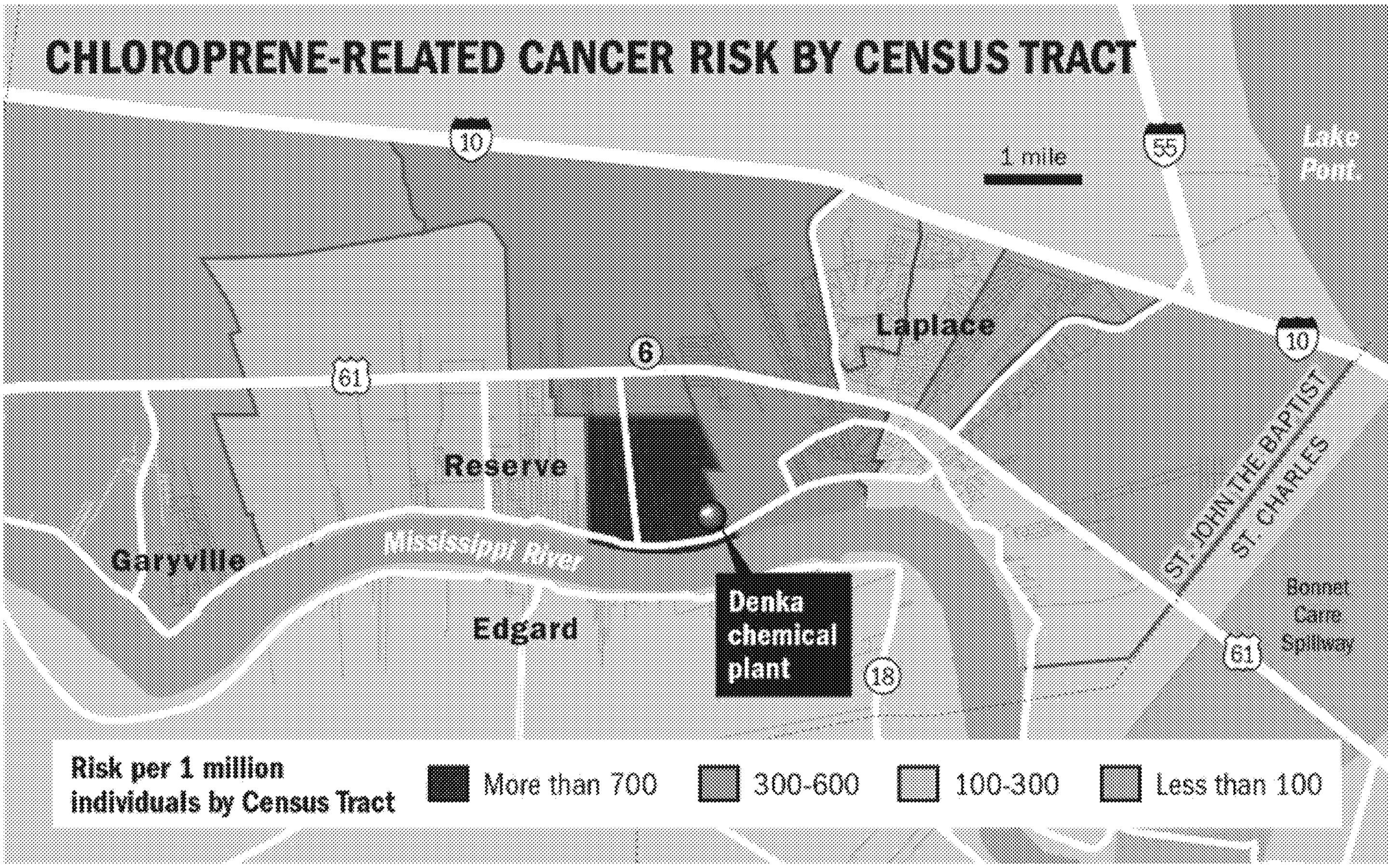
Here is the fact sheet. Webpage will be active sometime next week.

Message

From: Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent: 6/26/2017 1:23:41 PM
To: Gregory Langley [Gregory.Langley@LA.GOV]
Subject: FW: Baton Rouge Advocate - Timeline of air pollution problems at LaPlace chemical plant

Timeline of air pollution problems at LaPlace chemical plant

- BY DELLA HASSELLE | DHASSELLE@THEADVOCATE.COM



Source: Louisiana Environmental Action Network Advocate map

The Denka Performance Elastomer plant, formerly DuPont, seen here in LaPlace, La. Thursday, Dec. 22, 2016, has been tasked with reducing the emissions by 85 percent of a chemical, chloroprene, that the EPA has found to be "likely" carcinogenic.

- Advocate staff photo by MATTHEW HINTON

The Fifth Ward Elementary School seen here in Reserve, La. Thursday, Dec. 22, 2016, borders land of the Denka Performance Elastomer that has been tasked with reducing the emissions by 85 percent of a chemical, chloroprene, that the EPA has found to be "likely" carcinogenic.

History of Denka plant in LaPlace

Recently, it was discovered that the chemical plant Denka Performance Elastomer LLC was emitting high levels of chloroprene into the air, a toxic compound the Environmental Protection Agency says is likely able to cause cancer.

This timeline outlines when production started at the LaPlace plant and when scientists alerted the public about production-related dangers.

Story Continued Below

1931:

The chemical company DuPont Performance Polymers invents neoprene, a synthetic rubber that uses the chemical chloroprene to make wetsuits, orthopedic braces, electric insulation and other products.

1964:

DuPont opens a chemical plant in LaPlace.

1969:

DuPont begins producing chloroprene and neoprene at the LaPlace plant.

1976:

The EPA says DuPont violated the Clean Water Act. The case was referred to the U.S. Department of Justice, and the company paid $15,960 in penalties.

1997:

The EPA seeks a $31,800 civil penalty from DuPont for violating permits relating to the production of chloroprene.

2006:

The EPA cites DuPont for violating the Clean Drinking Water Act at its LaPlace location.

2008:

A DuPont facility in Rubbertown, an industrial area in Louisville, Kentucky, closes its doors after facing pressure from workers and environmental groups. Chloroprene production in LaPlace increases after DuPont moves its remaining operations to the St. John the Baptist Parish plant.

2010:

The EPA for the first time categorizes chloroprene as a "likely carcinogen."

2011:

EPA conducts the most recent National Air Toxic Assessment, which estimates exposure for 180 air toxins. The study finds the six census tracts with the highest estimated cancer risks nationally are all in St. John Parish due to chloroprene emissions from the DuPont plant.

2014:

DuPont becomes the largest emitter of chloroprene into the air in the United States, according to an EPA assessment used in the NATA study. Later that year, the EPA investigates DuPont for potentially violating the Clean Air Act.

November 2015:

DuPont sells the LaPlace chemical plant to a new company, Denka Performance Elastomer. Management changes hands, but Denka keeps 235 of the plant's 240 employees.

December 2015:

The EPA makes the 2011 National Air Toxic Assessment public. That same month, the EPA asks Denka for more information in an attempt to confirm emissions estimated in the study. The national regulatory agency also asks for proof that the plant is in compliance with air permits issued under the Clean Air Act.

May 2016:

The EPA visits the Denka facility to gather more information about chloroprene production at the plant and to understand what air pollution controls are in place.

Later that month, in coordination with the state Department of Environmental Quality, the agency announces an air sampling/monitoring plan for chloroprene in areas surrounding the Denka plant. It also requires the facility to start conducting its own emissions testing, and it starts working on updating the plant's chloroprene permit.

June 2016:

The EPA orders DuPont to pay $37,500 in in civil fines after the 2014 Clean Air Act investigation. The agency found DuPont failed to repair leaks of toluene, another chemical produced at the plant. Investigators also visit the plant to evaluate whether it is in compliance with the Clean Air Act.

October 2016:

The investigators send a draft report to the EPA's regional office.

December 2016:

Denka says it will contest the draft report. The company also asks for numerous redactions because of "confidential business" concerns.

Later that month, DEQ Secretary Chuck Brown tells the Parish Council that some residents are "fear-mongering" about the plant's emissions.

January 2017:

DEQ signs a consent decree with Denka. In it, Denka agrees to spend $17.5 million to reduce chloroprene emissions by 85 percent by the end of 2017. The company announces a timeline for retrofitting the plant with newer technology.

April 2017:

The EPA makes public the draft report outlining more than 50 potential Clean Air Act violations at the plant.

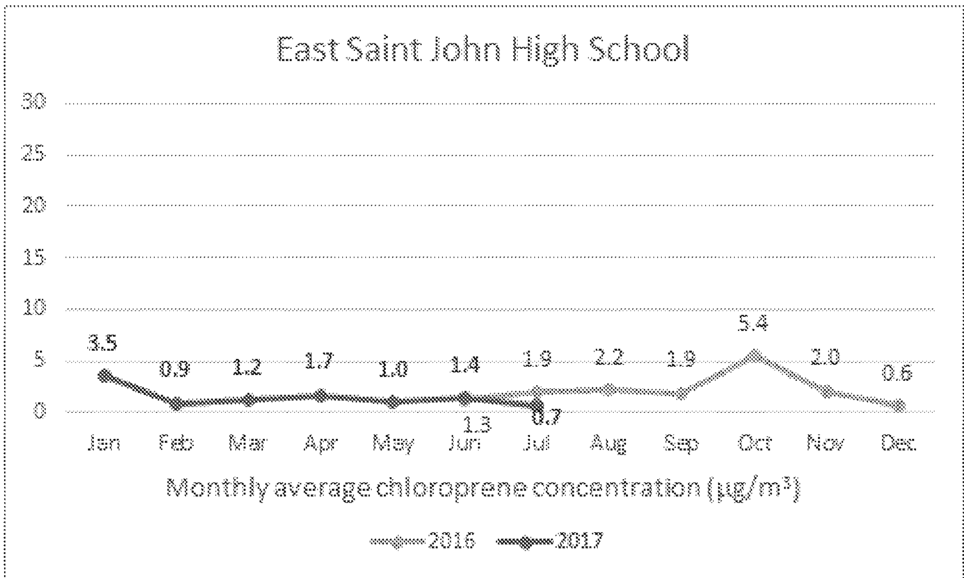
Message

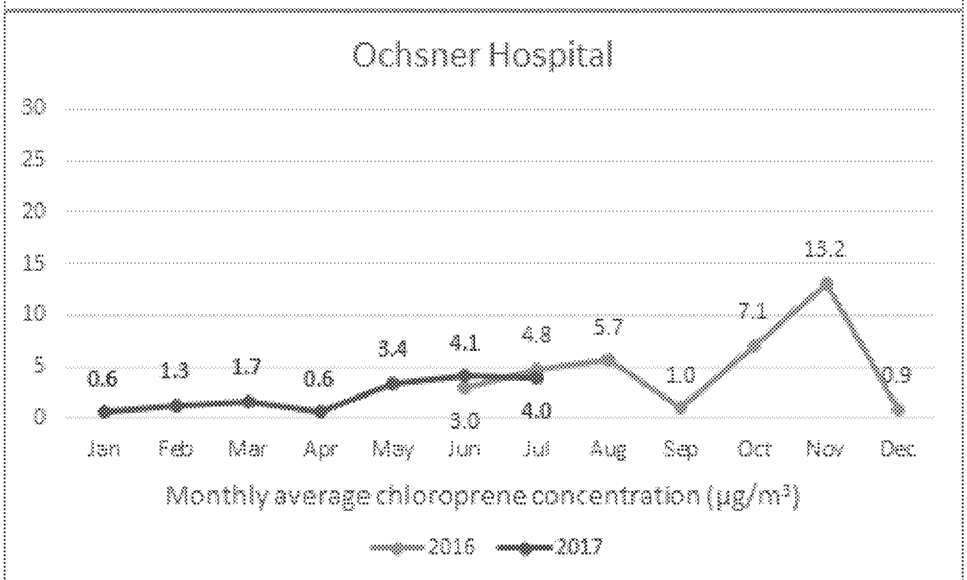
From: Gray, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=881C62B1E54142388C1DE2F8E3799C33-GRAY, DAVID]
Sent: 8/10/2017 7:51:39 PM
To: Gregory Langley [Gregory.Langley@LA.GOV]; 'Baileigh Rebowe' [b.rebowe@stjohn-la.gov]
CC: Jean.Kelly@la.gov; Tim Beckstrom (DEQ) [Tim.Beckstrom@la.gov]
Subject: RE: Denka handout
Attachments: Denka Handout.pdf; Denka_Fact_Sheet_EPA_Comments.docx

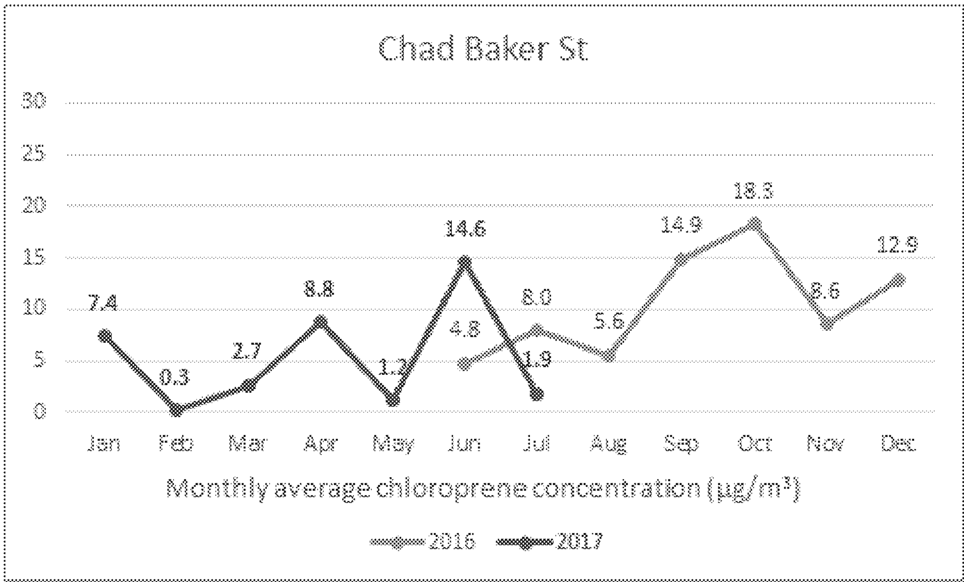
Greg,

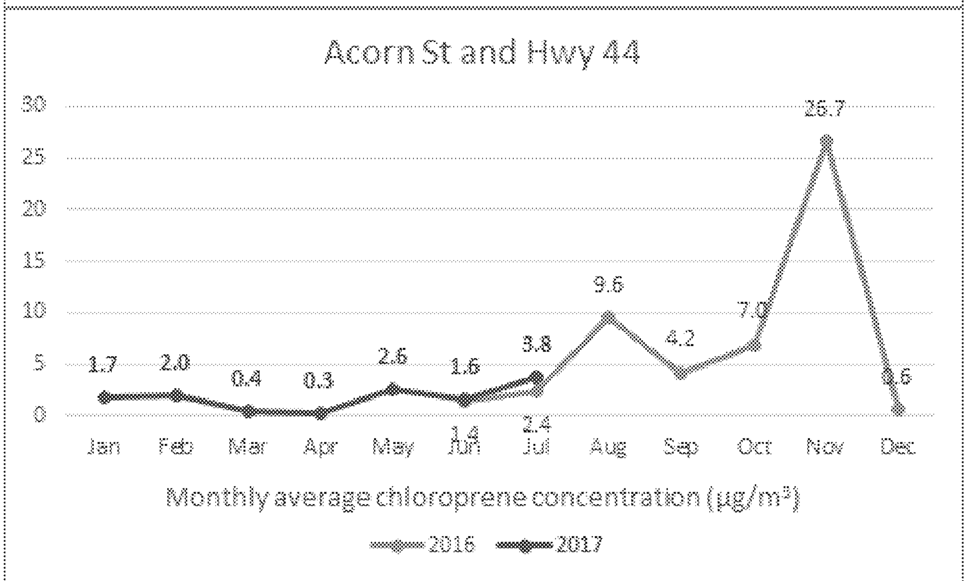
Attached is a copy of edits from EPA to the Denka Handout PDF. I had to do a MS Word File so I hope they all make sense to you. If not, call. Also, we prefer showing EPA data charts especially since the school discussion relies heavily on that data chart. As best I know, all of the Denka monitors are fence-line and not out in the community.

David









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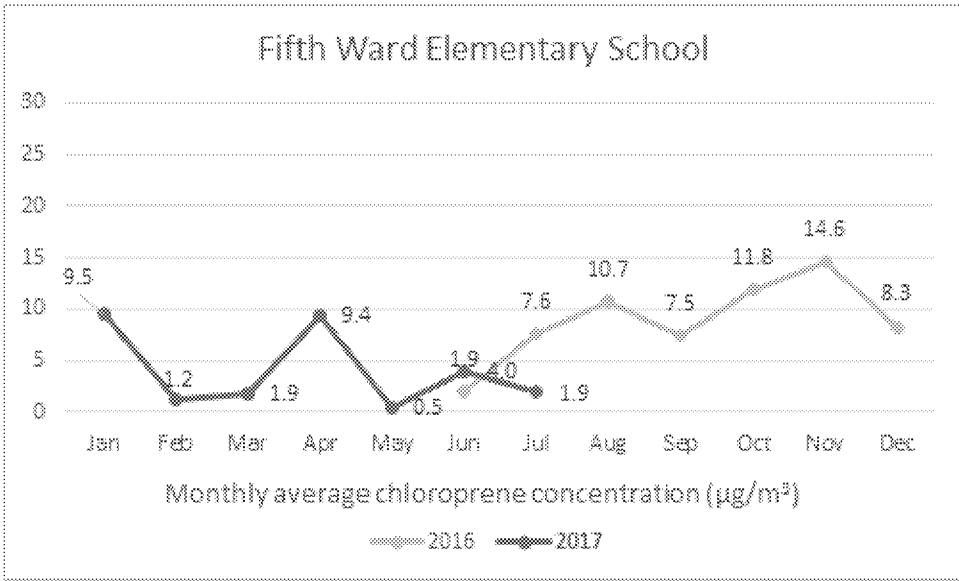

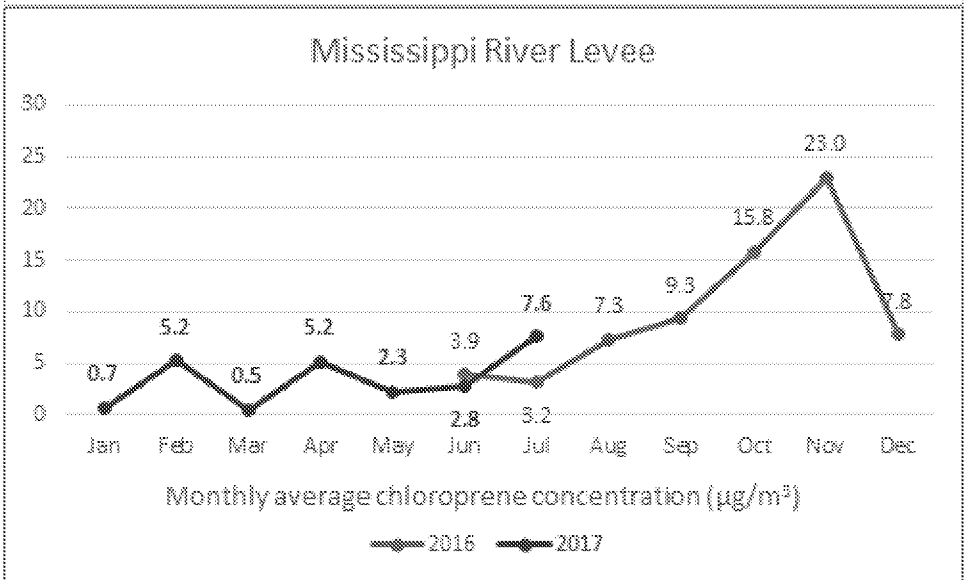

From: Gregory Langley [mailto:Gregory.Langley@LA.GOV]
Sent: Wednesday, August 09, 2017 12:59 PM
To: 'Baileigh Rebowe' <b.rebowe@stjohn-la.gov>; Gray, David <gray.david@epa.gov>
Cc: Jean.Kelly@la.gov; Tim Beckstrom (DEQ) <Tim.Beckstrom@la.gov>
Subject: Denka handout

We have prepared an informational handout for officials, etc., to use as a reference. It can be distributed at meetings or to anyone who asks for it. This is still a draft version. I will add the website address for LDEQ and would welcome any feedback from you about content, any additions you would like to see or questions. I want to be very brief with this and keep it as simple as possible (given the subject matter). I am shooting for Friday release, so I hope you can find time to give me a reply soon.
Greg

Denka, formerly DuPont, manufactures the chemical chloroprene to make neoprene synthetic rubber. The U.S. Environmental Protection Agency (EPA) reclassified chloroprene as a likely carcinogen in 2010. That reclassification was reflected in the National Air Toxics Assessment (NATA) map released by EPA in 2015. The map showed an elevated risk for cancer in the area around the Denka plant in LaPlace, La. An elevated risk of cancer means that people have an increased chance of developing cancer because of continuous inhalation exposure to chloroprene over a lifetime.

What is the NATA's purpose?

The purpose of NATA is to identify and prioritize air toxics, emission source types and locations that are of greatest potential concern in terms of contributing to population risk. NATA uses estimates of emissions from the facility and the EPA computer models to measure concentrations of chloroprene in the air and the potential population health risks; it is not designed to determine actual health risks to individual people. EPA uses the results of these assessments in many ways, including to:

- Work with communities in designing their own local-scale assessments,
- Set priorities for improving data in emissions inventories, and
- Help direct priorities for expanding and improving the network of air toxics monitoring.

The Louisiana Department of Environmental Quality (LDEQ) has worked with EPA to measure concentrations of chloroprene using monitors around the facility. Six monitors are maintained by EPA in areas adjacent and near the plant. Additionally, Denka maintains six monitors of their own in and around their site. LDEQ receives data from both EPA and Denka monitoring.

The Administrative Order on Consent

Denka voluntarily agreed to take actions to reduce air pollution from the plant. LDEQ worked with Denka to craft an Administrative Order on Consent (AOC), a legal contract, in which Denka agreed to install a series of new control technologies and measures designed to reduce emissions of chloroprene by 85 percent from the facility's 2014 chloroprene emissions. EPA supports LDEQ setting an enforceable schedule to make the needed changes to the facility. Denka has committed to spend more than $17 million to reduce chloroprene emissions.

Under the AOC, emission reductions devices will be installed on a set schedule, culminating with the installation of the Regenerative Thermal Oxidizer (RTO) by the end of the fourth quarter of 2017. The first two phases have been installed and are operating. Denka has applied for an extension of time for installation of the third phase because of complexities in the engineering design for the modification. The final phase will be the installation of the RTO. The RTO is on-site awaiting installation.

What about the 0.2?

Once the control measures are in place, LDEQ will again assess the emissions at the Denka facility. While there is currently no federal or state standard for allowable concentrations of chloroprene in the air, EPA has offered a concentration value of 0.2 micrograms per cubic meter (ug/m^3) to guide efforts to reduce emissions. The 0.2 ug/m^3 is not an air quality standard; it represents a guide for a lifetime (not short or daily) average.

Questions about the school

Some LaPlace residents voiced concerns about the risk at the 5th Ward Elementary School, which is near the Denka plant. The Louisiana Department of Health (LDH) and LDEQ conferred regarding the environmental status at the school. LDH officials indicated they have found no reason that children cannot attend the school. Monitoring results from the EPA monitor at this location and available on the EPA website (below) has shown elevated concentrations of chloroprene on some days. This does not indicate continuous exposure.

Monitoring results

For EPA's monitoring results, go to [HYPERLINK "https://www.epa.gov/la/laplace-st-john-baptist-parish-louisiana"]

Here are the most recent month's monitoring results from Denka's monitors:

[NOTE: I presume you are showing Denka's data since it has not been previously released versus showing EPA generated data? We, of course, prefer EPA's data.]

Message

From: Woods, Clint [woods.clint@epa.gov]
Sent: 9/26/2019 1:08:40 AM
To: Chuck.Brown@la.gov
CC: Idsal, Anne [idsal.anne@epa.gov]; Gray, David [gray.david@epa.gov]; McQueen, Ken [McQueen.Ken@epa.gov]; Chancellor, Erin [chancellor.erin@epa.gov]
Subject: Fwd: Copy of signed letter to LDEQ
Attachments: image2019-09-23-132129.pdf; ATT00001.htm

Secretary,

Per our conversation earlier - Thanks!

Begin forwarded message:

Message

From: Idsal, Anne [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=B1BECA8121FB47A08E82B6BF2247A79B-IDSAL, ANNE]
Sent: 11/15/2018 9:26:16 PM
To: Chuck Brown [Chuck.Brown@LA.GOV]
CC: Gray, David [gray.david@epa.gov]; Chancellor, Erin [chancellor.erin@epa.gov]
BCC: Williams, Odessa [Williams.Odessa@epa.gov]
Subject: Re: Denka Follow-Up

Thanks Dr. Brown. I'll ask Odessa to set up a time for a call.

Sent from my iPhone

On Nov 15, 2018, at 12:51 PM, Chuck Brown <Chuck.Brown@LA.GOV> wrote:

> Good afternoon Administrator,
> Yes let's discuss on tomorrow morning.
>
> Chuck Carr Brown, Ph.D.
> Secretary
> Louisiana Department of Environmental Quality
> 602 North 5th Street
> Baton Rouge, Louisiana 70802
> 225-219-3950
>
> ---
>
> **From:** Idsal, Anne <idsal.anne@epa.gov>
> **Sent:** Thursday, November 15, 2018 1:26 PM
> **To:** Chuck Brown <Chuck.Brown@LA.GOV>
> **Cc:** Gray, David <gray.david@epa.gov>; Chancellor, Erin <chancellor.erin@epa.gov>
> **Subject:** Denka Follow-Up
>
> Good afternoon Dr. Brown,
>
> I wanted to follow up with you on the 114 question we discussed the other week. Staff has provided the following information for your consideration.
>
> Would you be able to visit tomorrow morning to circle back?
>
> Best,
> Anne
>
> EPA believes there are unaccounted-for chloroprene emissions at the Denka facility. These emissions could include under-reported maintenance activity emissions, fugitive emissions and equipment leaks, improperly vented emissions, variably emitting area sources and sewers, and/or emissions from malfunctioning processes or improperly controlled operations.

Section 114 of the Clean Air Act, 42 U.S.C. § 7414, provides EPA inspection and information gathering authority to determine whether any person is in violation of the Act. Section 114 is the authority under which EPA conducts CAA inspections and sends out information collection requests/ letters. Under Section 114(a)(1) EPA may require any person who owns or operates any emission source to install, use, and maintain monitoring equipment; sample emissions in such manner as the Administrator shall prescribe; and provide such other information as the Administrator may reasonably require. Under Section 114(a)(2), EPA is provided right of access to carry out any emissions sampling EPA has required under Section 114(a)(1).

In our proposed approach, EPA will first ask Denka to provide EPA on-site access and cooperate with EPA in an agency-led process area monitoring implementation effort, pursuant to an agreed-upon timeframe. In order to adequately evaluate the PAM results, EPA would likely request operational and maintenance information. If Denka does not voluntarily provide the necessary site access and information needed to conduct the process area monitoring and evaluate the results, EPA would issue a letter under the authorities in Section 114(a)(1) and (2) to Denka to require site access and cooperation with EPA-led monitoring. The letter would include a required timeline for PAM implementation, but would allow for flexibility based on a reasonable request by Denka for an extension. Additionally, EPA believes that Section 114 (a)(1) authority could be used to require Denka to directly implement and manage portions of the PAM, but this is not the proposed approach at this time.

EPA's potential use of Section 114 to implement the PAM and obtain additional information directly relates to determining the extent and accuracy of Denka's self-reported emissions. More specifically, the results obtained from the PAM can be used to determine compliance with Denka's permit and provisions in the federally enforceable SIP that require Denka to identify and report all emissions sources and actual emissions at the facility. The results of the PAM will inform our settlement discussions and would be helpful in identifying sources for potential emissions reductions to get concentrations at the fenceline closer to the acceptable risk range of less than $0.2\mu g/m^3$.

Meeting between EPA Region 6,
Denka Performance Elastomer, LLC, and
E.I. du Pont de Nemours & Co., Inc.
February 18, 2016

Meeting Agenda

I. General Introductions

II. Introduction to DPE

III. DPE's commitment to cooperation with EPA

IV. NATA Study

V. Section 114 responses

VI. Details of the Risk and Technology Review (RTR) Process

VII. Conclusion and discussion of next steps

Message

From: Robert E. Holden [reholden@liskow.com]
Sent: 5/16/2016 10:29:25 PM
To: Chuck Carr Brown Ph. D. (Chuck.Brown@LA.GOV) [Chuck.Brown@LA.GOV]
CC: Elliott Vega (Elliott.Vega2@LA.GOV) [Elliott.Vega2@LA.GOV]; Leathers, James [Leathers.James@epa.gov]; Lannen, Justin [Lannen.Justin@epa.gov]; Lassiter, Penny [Lassiter.Penny@epa.gov]; Lori E. Sanders (Lori.e.sanders@dupont.com) [Lori.e.sanders@dupont.com]; Lourdes Iturralde (lourdes.iturralde@la.gov) [lourdes.iturralde@la.gov]; herman.robinson@la.gov; Michael.E.Schu@dupont.com; Eric E. Jarrell (ejarrell@kingkrebs.com) [ejarrell@kingkrebs.com]
Subject: Denka Performance Elastomer Pontchartrain Facility
Attachments: removed.txt; 2016-05-16-ltr to Dr. Chuck Carr Brown.pdf

Dr. Brown:

On behalf of Denka Performance Elastomer, LLC, please find attached our letter concerning this issue.

Bob Holden

(504) 556-4130 Direct
(504) 556-4108 Fax
(504) 813-3049 Cell

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(713) 651-2908 Fax

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May 16, 2016

Robert E. Holden

Direct: (504) 556-4130
REHolden@Liskow.com

(Via Federal Express and Electronic Mail)
Dr. Chuck Carr Brown
Secretary, Louisiana Department of Environmental Quality
602 North Fifth Street
Baton Rouge, LA 70802

Re: Denka Performance Elastomer LLC
Pontchartrain Facility

Dear Dr. Brown:

We want to thank you for meeting on Tuesday, May 10, with Denka Performance Elastomer LLC (DPE) concerning the chloroprene ambient air risk assessment issues at the Pontchartrain Facility near LaPlace. DPE appreciates the Louisiana Department of Environmental Quality's (LDEQ's) efforts to address these issues with DPE cooperatively.

At the May 10 meeting, you requested DPE to advise LDEQ by Friday, May 13, which deadline you agreed to extend to Monday, May 16, of what DPE could do to achieve a potential risk-based ambient air standard for chloroprene of 0.2 $\mu g/m^3$ on an annual average basis. In the short time allowed, we have developed this response on behalf of DPE. We reserve the right to supplement and/or modify some of the following points as we develop more information. We look forward to discussing this with you in more detail.

I. The Proposed Ambient Standard Should be Based on the Current Toxicological Information

The LDEQ and the EPA are currently reviewing chloroprene risk assessment issues for chloroprene based on the EPA's Integrated Risk Information System (IRIS) inhalation Unit Risk Estimate (URE) set out in the IRIS 2010 Toxicological Review of Chloroprene, and on the identification in that Review of a mutagenic mode of action (MOA). A more recent, comprehensive and peer reviewed study by Allen, *et al.* (2014),[1] concluded that the 2010 IRIS

[1] Allen BC, Van Landingham C, Yang Y, Youk AO, Marsh GM, Esmen N, Gentry PR, Clewell III HJ, Himmelstein MW. (2014) A constrained maximum likelihood approach to evaluate the impact of dose metric on cancer risk assessment: Application to β-chloroprene. *Regulatory Toxicology and Pharmacology* 70: 203–213.

URE is approximately 100 times larger than could be supported by a scientifically valid URE, and that chloroprene does not have a mutagenic MOA.

In addition, it is important for the LDEQ to recognize that the National Academy of Sciences' National Research Council (NRC) recommended an extensive overhaul of the IRIS toxicity evaluation methodology in 2011[2] and again in 2014,[3] and Congress instructed EPA to change the IRIS methodology to address the NRC recommendations (in 2012, 2014, and 2015).[4] EPA has advised Congress that it is implementing these changes.[5] Of course, the IRIS 2010 Toxicological Review of Chloroprene was completed prior to these changes, and has not been updated to be consistent with these changes.

In general, the NRC recommended that EPA standardize the IRIS process in order to provide more transparency and to ensure that EPA takes into account all relevant and reliable evidence. Using methodology consistent with the NRC recommendations, the Allen, *et al.* study recommends an inhalation URE of approximately 100 times smaller than the 2010 IRIS URE, and it concludes that chloroprene does not operate in a mutagenic MOA. The 2010 IRIS URE for chloroprene, which includes a 60% upwards adjustment based on the concern that chloroprene had a mutagenic MOA, is 5×10^{-4} per $\mu g/m^3$. In contrast, the Allen, *et al.* study derived a maximum-likelihood estimate of 1.86×10^{-6} per $\mu g/m^3$.

Moreover, the epidemiologic studies referenced in the 2010 IRIS study do not establish a clear causal connection between occupational chloroprene exposure and liver and lung cancers. Consequently, one of EPA's arguments to justify a proposed "likely to be carcinogenic to humans" classification for chloroprene would not be supported by a revised assessment of the epidemiological data coupled with a rigorous integration of evidence.

---

2 National Research Council, Review of the Environmental Protection Agency's Draft IRIS Assessment of Formaldehyde (2011).

3 National Research Council, Review of EPA's Integrated Risk Information System (IRIS) Process, at 3 (2014).

4 H.R. Rep. No. 112-331 at 1072 (Dec. 15, 2011) (Conference Committee joint explanatory statement accompanying 2012 Consolidated Appropriations Act); 160 Cong. Rec. H475, H977 (Jan. 15, 2014) (explanatory statement accompanying 2014 Consolidated Appropriations Act); H. R. Rep. No. 113-551 at 59 (July 23, 2014), *cited in* 160 Cong. Rec. H9307, H9766 (Dec. 11, 2014) (explanatory statement accompanying Consolidated and Further Continuing Appropriations Act of 2015).

5 *See* U.S. Environmental Protection Agency Office of Research and Development, EPA's Integrated Risk Information System Program Progress Report and Report to Congress at 11 (June 2012); U.S. Environmental Protection Agency Office of Research and Development, EPA's Integrated Risk Information Program Progress Report and Report to Congress at 3 (Feb. 2015).

During our meeting on May 10, you advised us that LDEQ, based on the 2010 IRIS URE, was considering an ambient standard of chloroprene of 0.2 $\mu g/m^3$ on an annual average basis. Based on the Allen, *et al.* study, the appropriate ambient standard would be much higher. Our preliminary analysis, if the Allen, *et al.* findings are given full weight, is that the limiting concentration for a potential ambient air standard should be based on the Reference Concentration (RfC) for non-cancer risks of 20 $\mu g/m^3$ as set out in the 2010 IRIS Toxicological Review of Chloroprene.

Accordingly, and in response to your request, DPE will evaluate options for emission control strategies to meet both LDEQ's suggested 0.2 $\mu g/m^3$ annual average standard and to meet a more accurate 20 $\mu g/m^3$ ambient standard on an annual average basis. It is important to recognize, however, that any potential ambient standard based on the 2010 IRIS URE is scientifically flawed and would be far more stringent than required to protect human health and the environment.

II. Ambient Air Standard Evaluation Activities

As you know, the evaluation of chloroprene concentrations near the Pontchartrain Facility requires an analysis of ambient air concentrations based on air monitoring and air modeling information.

A. Air Monitoring

In February, LDEQ undertook air sampling in the vicinity of the Pontchartrain Facility. DPE has not yet been provided with LDEQ's air sampling results. This information will need to be addressed in our study.

On March 29, LDEQ requested DPE to submit an air monitoring plan to LDEQ for review and approval. DPE submitted the monitoring plan to LDEQ on May 6. As soon as DPE has LDEQ's approval of the plan, DPE can commence air monitoring.

B. Air Modeling

On March 29, and by letter dated March 30, LDEQ requested DPE to submit a plan for air dispersion modeling of the Pontchartrain Facility's air emissions. This plan was submitted to LDEQ on April 13 as required. After DPE receives approval of that air modeling plan, DPE can commence the air dispersion modeling study.

III. Evaluation of Emission Abatement Options

As you know, EPA has commenced a Risk and Technology Review (RTR) of the Pontchartrain Facility's chloroprene emissions. This involves a systematic review both of available MACT level controls under Clean Air Act Section 112(d) and a residual risk review under Clean Air Act Section 112(f). 42 U.S.C. § 7412(d) and (f). You have requested that DPE evaluate air control or abatement options and implement controls much more rapidly than can be accomplished as a result of EPA's RTR evaluation.

DPE is willing to work with LDEQ to achieve early reductions of chloroprene emissions; however, at the same time, DPE requests LDEQ to recognize that emission requirements must ultimately be based on good science. In response to your request, DPE agrees to review available emission control technologies potentially available for use at the Pontchartrain Facility at this time, recognizing that available emission control technology may substantially reduce chloroprene emissions, but may not necessarily achieve an unrealistic standard. Even with the recent scientific information, it will take time and resources for review and reconsideration of the IRIS 2010 URE. DPE will be willing to consider the installation of emission controls and to consider with LDEQ whether the installation of available emission reduction controls will meet LDEQ's requirements pending a review by EPA IRIS of the 2010 URE, and during the pendency of EPA's RTR process. We can undertake these discussions on a mutually agreeable schedule.

IV. Conclusion

DPE will evaluate options to achieve LDEQ's identified potential ambient air standard of 0.2 $\mu g/m^3$ annual average, as well as a more scientifically appropriate potential standard of 20 $\mu g/m^3$ on an annual average basis. To conduct its evaluation, it is important that DPE review LDEQ's recent air sampling results. In addition, DPE's evaluation will require LDEQ's approval of its air monitoring and air modeling plans.

DPE is willing to discuss with LDEQ whether it will be possible to install emission control technology on an expedited basis. We will work with LDEQ to develop a mutually agreeable schedule to review the possible options.

We also want to thank you for agreeing to schedule a meeting on May 27 with Mr. Mitsukuni Ayabe, Vice President of Denka Company Limited. Mr. Ayabe is a very senior executive for Denka Company, and Denka Company is the majority investor in DPE. We look forward to the meeting.

We look forward to our continued discussions with LDEQ on this matter.

Yours very truly,

Robert Holden

Robert E. Holden
REH:ddt

cc: **(Via electronic mail)**
Lourdes Iturralde, Assistant Secretary, Environmental Compliance, LDEQ
Herman Robinson, Esq., Office of Legal Services, LDEQ
Elliot Vega, Assistant Secretary, Environmental Services, LDEQ
James Leathers, U.S. EPA Region 6
Justin Lannen, U.S. EPA Region 6
Penny Lassiter, U.S. EPA Region 6
Michael Schu, Esq. DuPont
Lori Sanders, Esq. DuPont
Eric Jarrell, Esq, King Krebs

4442997_1

Message

From:	Lannen, Justin [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=B6A08938C4444196BABDE5BF47045EC6-LANNEN, JUSTIN]
Sent:	2/19/2016 4:27:11 PM
To:	Hansen, Mark [Hansen.Mark@epa.gov]; Tegan Treadaway [Tegan.Treadaway@LA.GOV]; Bryan Riche [Bryan.Riche@LA.GOV]; Verhalen, Frances [verhalen.frances@epa.gov]
CC:	Leathers, James [Leathers.James@epa.gov]
Subject:	Denka's PPT
Attachments:	EPA Visit 2-18-16.pptx

Please find attached Denka Performance Elastomer's PowerPoint presentation from yesterday's meeting.

Justin

Denka Performance Elastomer LLC

Robert Holden – Attorney, Liskow & Lewis
Jorge Lavastida – Plant Manager, DPE

Denka
Denka Performance Elastomer

AGENDA

- Introductions
- Introduction to Pontchartrain Site and DPE
- DPE's commitment to environmental excellence, safety and health
- DPE's desire and commitment to collaborate with EPA and LDEQ
- General Discussion
    - Section 114 Request and Response
    - NATA Study
    - RTR Process
    - Future steps and activities

Denka
Denka Performance Elastomer

Our Pontchartrain Site

Site Overview

GENERAL

- ❑ 1964 – Site opened – Nylon Intermediate facility
- ❑ ACREAGE
  - 1137 Total Acres
  - 200 Acres - Manufacturing

TWO COMPANIES

- ❑ DuPont – Site Owner / Landlord
- ❑ Denka Performance Elastomer LLC

MAIN PRODUCTS

- ❑ Neoprene - ~70MM lbs / year production
  - Startup in 1970 (DuPont)
  - Sold to DPE on 10/31/2015
- ❑ Para-phenylenediamine
  - Intermediate - Kevlar® production
  - Startup in 1982

Pontchartrain Monomer Building

SITE DEMOGRAPHICS & STATISTICS

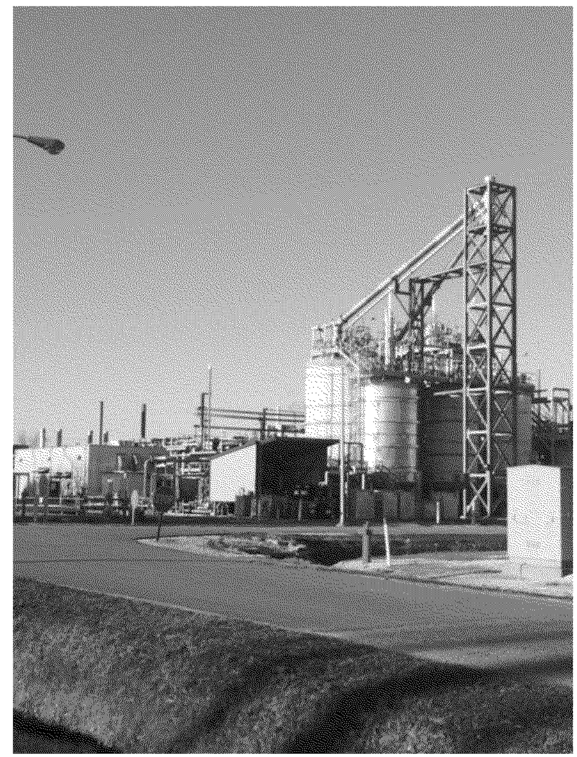
	NEOPRENE
TOTAL EMPLOYEES	*245*
RIVER PARISH RESIDENTS	*55%*
ANNUAL PAYROLL	*$27MM*
RES. CONTRACTORS	*85 - 95*
APPROXIMATE PAYROLL	*$8.1MM*
TAXES (STATE & LOCAL)	*$1.9MM*
VALUE OF PURCHASES	*$76.5MM*

Denka Performance Elastomer LLC

- Formed to purchase Neoprene business from DuPont
- American entity with 2 Japanese parent companies
  - Denka Company Limited – 70% Ownership

Denka Company Limited

  - Mitsui & Co. – 30% Ownership



Pontchartrain Poly and Finishing Buildings

Company Name: DENKA COMPANY LIMITED

DENKI KAGAKU KOGYO K. K. – prior to 10/1/2015

Head Office: Tokyo, Japan

Web site: www.denka.co.jp

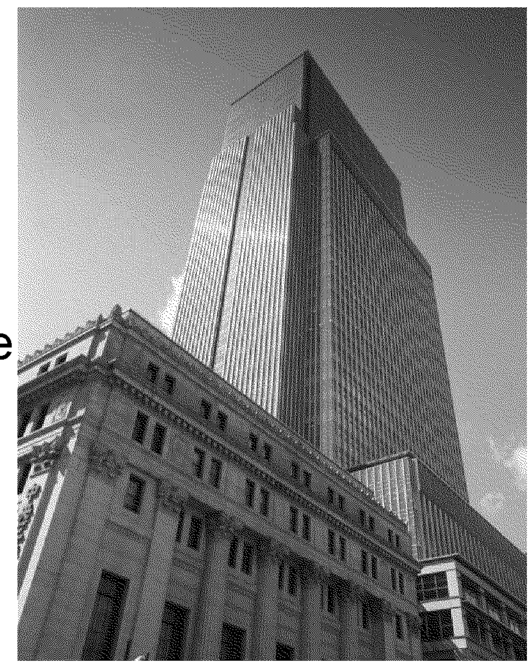
Established: 5/1/1915 – celebrated 100 years in 2015

Employees: 5,300

Net Sales ('14): ¥ 383,978 million ($3.4B)

Leading Chemical Co in Japan: Elastomers, Performance Plastics, Inorganic Materials, Electronics, Life Science

6 Domestic Plants, 9 Overseas including Pontchartrain



Denka's Corporate Sustainability Report

Denka Performance Elastomer

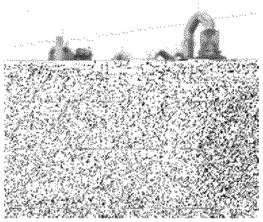
■Society

Reconstruction support volunteer

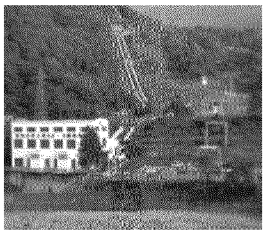
Safe and pleasant workplaces

Omi plant tour

■Environment



Recycling plant



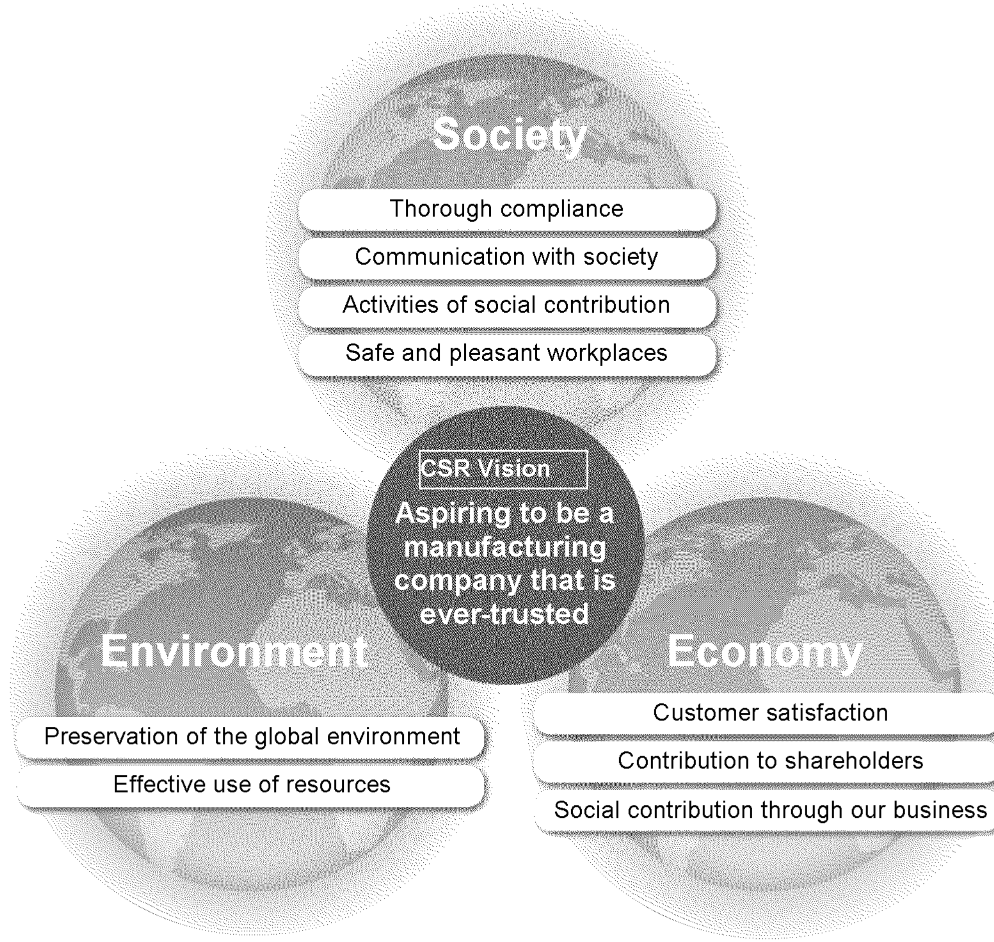
Hydropower station

■Economy

Mega Solar Power Plant

Results Briefing

Green Asia Special Zone



We engage in social dialogue to find out exactly what our stakeholders need while developing our technological strengths to meet their expectations. At the same time, we will effectively utilize limited natural resources to create valuable things.

DPE ORGANIZATIONAL STRUCTURE

Denka
Denka Performance Elastomer

Executive Officer 執行役員			Division Manager 部長	Area Manager 課長	
CEO & President Koki Tabuchi	EO (VP Admin.) Nao Kawamura		HR & GA Tricia Ferguson		Admin. Team
			Accounting Richard Miksell		
			Procurement & IT Mickey St Pierre		
	EO (VP Technology) Masanobu Kosaka	EO(Plant Mgr) Jorge Lavastida		Monomer Alvin Gaubert	Operations Team
				Polymer Jack Hinson	
				Finishing Kale Hooper	
			Maintenance and Relaibility Alfred Ogden (*)	Reliability Alfred Ogden(*)	
				Maintenance David Sutton	
			Manufactureing Technology Luis Colon	Laboratory Clara Sanchez	
			SHE Patrick Walsh	Doris Grego Doug Melancon CJ Stewart Troy Roussel	
				Supply Chain Stephen Landaiche	
	EO (VP Sales) Satoshi Yamamoto				Sales Team

235 of 240 DuPont employees joined DPE on Oct 31, 2015

DPE's Commitment to Excellence in EH&S Performance

- *DPE is committed to excellence in health, safety and environmental performance and will work hard to produce chemicals safely, responsibly and profitably.*
- *(we will) continually improve EHS performance by setting goals, reviewing programs and procedures, and reporting on performance*

From DPE's EH&S Policy signed on 10/29/15 by CEO K. Tabuchi

- Expectations set by Denka and DPE on our Site Operations Team are clear
  - Denka Principle: ***(to) boldly confront challenges with determination and sincerity***
- My Personal Commitment – 3 goals:
  - Excellence in safety and environmental performance
  - Reliability of Product Supply as we build a very strong business
  - Continuing to make Pontchartrain a great place to work where people feel valued and see themselves building a long term career

Site Recognitions - Environmental

Denka
Denka Performance Elastomer

EPA Awards:

- 1995 – USEPA Region 6 Regional Administrator's Environmental Excellence Award for Hazardous Waste Minimization
- 1999 – USEPA Region 6 Regional Administrator's Environmental Excellence Award for Pollution Prevention
- 1997 (2), 1998, 1999, 2000, 2001, 2002, 2008, 2009 – Governors Environmental Leadership Award for Pollution Prevention Achievement
- EPA 1995 – chloroprene reduction project – elimination of 15MM lbs of hazardous waste, including over 5MM lbs of aqueous hazardous waste disposed in deepwells
- EPA 1999 – major source reduction of process solvents cellosolve and toluene

DEQ Governor's Awards

- 1997 – major source reduction of process solvents cellosolve and toluene; shutdown of hazardous waste incinerator
- 1998 – Reuse of pentane diluent resulted in significant waste minimization
- 1999 – two source reduction projects – brine neutralization project and waste organics reduction project
- 2000 – spray condenser project reduced chloroprene emissions
- 2001 – elimination of hazardous wastewaters into underground injection wells
- 2002 – chloroprene emissions reduction program
- 2008 – source reduction of waste neoprene
- 2009 – reduction of aqueous waste in deepwells

DPE is Committed to Collaboration in this Process

- Encouragement from Parent Companies to take the initiative and meet with EPA
- Section 114 Response
  - Breadth of response - Included Info from years prior to DPE ownership
  - Timeliness
- 2015 NATA Study Report on CP – Affects Only Our Facility
  - Should facilitates collaboration

General Discussion

- Section 114 Information Request
- NATA Study
- Risk & Technology Review Process
- Future Steps

Model Unique Pt. Identifier	SOURCE_DESCRIPTION	SOURCE_TYPE	PERMIT	RELEASE_POINT_DESCRIPTION	RELEASE_POINT_TYPE	2014 LDEQ EIS reported emissions of chloroprene	UNIT	Percent contribution to off-site concentrations/risk at selected receptor*
L00002A	Poly Building Wall Fans	Other	2249-V7	1700-66 BUILDING EXHAUST FAN	Area	31663	lb	24.5%
L00001A	Poly Kettles Vent Condenser	Other	2249-V7	1700-3 POLY KETTLES COMMON VENT	Stack	45735	lb	19.2%
L00005A	Strippers Condenser Vent	Other	2249-V7	1700-2 STRIPPERS COMMON VENT	Stack	18340	lb	7.8%
L00006A	CD Refining Column Jet	Other	2249-V7	1700-20 CD REFINING COLUMN JETS	Stack	10985	lb	4.0%
L00007A	CD Refining Column Jet (Spare)	Other	2249-V7	1700-20A CD REFINING COLUMN JET SPARE	Stack	10985	lb	3.9%
L00016A	Fugitive Emissions - Neoprene Unit	Fugitive Emissions	2249-V7	1-93 FUGITIVE EMISSIONS NEOPRENE UNIT	Fugitive	4182	lb	3.4%
L00015A	Surge Tank (Waste Water Tank)	Wastewater Treatment System	2249-V7	4-95 NO. 1 AERATION TANK	Area	4339	lb	3.2%
L00009A	2MM Pound CD Storage Tank	Above ground storage vessel	2249-V7	1700-21A 2MMLB CD STORAGE TANK	Vent	9372	lb	3.1%
L00017A	Vent Header System	Other	2249-V7	1700-63 1712 COMMON VENT HEADER	Stack	3878	lb	2.6%
L00004A	West Hot Dryer Exhaust	Other	2249-V7	1700-28 WEST HOT DRYER	Stack	24480	lb	2.5%
L00003A	East Hot Dryer Exhaust	Other	2249-V7	1700-27 EAST HOT DRYER	Stack	24480	lb	2.5%
L00010A	Poly Kettles Manholes / Strainers (3, 4, & 5) Common Vent	Other	2249-V7	1700-13A LPK MH/STRAINERS (3,4 & 5)	Vent	8029	lb	2.4%
L00020A	NEOPRENE UNIT CONDITION XVII	GC XVII Emissions	2249-V7	NEOPRENE UNIT GC XVII	Area	2797	lb	2.3%
L00012A	Unstripped Emulsion Storage Tanks Common Vent	Above ground storage vessel	2249-V7	1700-5 EMUL STORAGE TANKS 4,5,6,7, & 8	Vent	4950	lb	2.2%
L00022A	HCl Feed Tanks' Scrubber	Scrubber	206-V2	7000-17 HCL FEED TANKS	Vent	2222	lb	2.2%
L00011A	Poly Kettles Manholes / Strainers (1 & 2) Common Vent	Other	2249-V7	1700-13 POLYKETTLE MANHOLE	Vent	6518	lb	1.9%
L00019A	CHLOROPRENE UNIT CONDITION XVII	GC XVII Emissions	3000-V5	CHLOROPRENE UNIT GC XVII	Area	3100	lb	1.6%
L00008A	CD Vent Condenser	Condenser	3000-V5	1110-4 CD VENT CONDENSER	Stack	9392	lb	1.5%
L00018A	No. 6, 7, 8, 10, 13, & 14 Unstripped Storage Tanks Depressure Vent (Surge Control Vessels)	Other	2249-V7	1700-56 UNSTRIPPED TANKS DEPRESS. VENT	Stack	3814	lb	1.2%
L00024A	Waste Storage Tanks' Condenser	Condenser	206-V2	2-74 WASTE STORAGE TANKS	Vent	1746	lb	1.0%

* Modeled receptor located west of the facility at residential area off E 31st Street

Message

From: Ted Broyles [Ted.Broyles@LA.GOV]
Sent: 2/8/2018 5:05:07 PM
To: steven.shermer@usdoj.gov; Lannen, Justin [Lannen.Justin@epa.gov]
Subject: Denka
Attachments: Report on LDOH Panel on Chloroprene in Air 11-14-17 Final_Full (002).pdf

We received this from the La. Department of Hospitals today.

Can we set up a call for next week to discuss next steps/lead agency on the excess emissions from the condensers revealed by the performance test? Assistant Secretary Iturralde would like to be on the call with us since we are getting pushed by the DEQ secretary. The 13th at 10:00 am (CT); just about any time the afternoon of the 14th; the 15th at 11:00 a.m are all available. I can work in other times if necessary. Thanks.........

TED R. BROYLES, II
Attorney III
Enforcement and Remediation

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF THE SECRETARY
Legal Division
P.O. Box 4302
Baton Rouge, LA 70821-4302
225.219.3985–Office
225.219.4068–Facsimile

Message

From: Ted Broyles [Ted.Broyles@LA.GOV]
Sent: 1/3/2017 10:29:17 PM
To: Lannen, Justin [Lannen.Justin@epa.gov]; robyn.hanson@usdoj.gov [Robyn.Hanson@usdoj.gov]; Caballero, Kathryn [Caballero.Kathryn@epa.gov]; Spina, Providence [Spina.Providence@epa.gov]; Osbourne, Margaret [osbourne.margaret@epa.gov]; Welton, Patricia [Welton.Patricia@epa.gov]; Steven D. Shermer (Steven.Shermer@usdoj.gov) [Steven.Shermer@usdoj.gov]
CC: Lourdes Iturralde [Lourdes.Iturralde@LA.GOV]; Robert E. Holden (reholden@liskow.com) [reholden@liskow.com]; herman.robinson@la.gov; Dwana King [Dwana.King@LA.GOV]
Subject: RE: Denka Performance Elastomers AOC
Attachments: AOC draft 1-03-17.docx

All:

I've attached a draft I believe incorporates all of the changes we discussed this afternoon.

Bob Holden: In addition to the proposed changes we discussed this afternoon, Robyn Hanson's keen eye caught a couple of typos. Those are also in redline.

From: Ted Broyles
Sent: Tuesday, January 03, 2017 12:56 PM
To: Justin Lannen (Lannen.Justin@epa.gov); 'robyn.hanson@usdoj.gov'; Caballero, Kathryn; 'Spina, Providence'; Margaret Osbourne (osbourne.margaret@epa.gov); Welton, Patricia; Steven D. Shermer (Steven.Shermer@usdoj.gov)
Cc: Lourdes Iturralde; Robert E. Holden (reholden@liskow.com); Herman Robinson; Dwana King
Subject: Denka Performance Elastomers AOC

Please find attached the LDEQ response draft to be discussed at 2:00 this afternoon.

This morning, the LDEQ Secretary advised that he is willing to sign the attached AOC. I discussed the draft with Bob Holden and have copied Bob on this email. The secretary understands the governments have a call this afternoon.

TED R. BROYLES, II
Attorney III
Enforcement and Remediation

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF THE SECRETARY
Legal Division
P.O. Box 4302
Baton Rouge, LA 70821-4302
225.219.3985–Office
225.219.4068–Facsimile

CERTIFIED MAIL
(############) RETURN
RECEIPT REQUESTED

DENKA PERFORMANCE ELASTOMER LLC
c/o Name of Agent
Agent for Service of Process
Service Address
Service Address

RE: ADMINISTRATIVE ORDER ON CONSENT ENFORCEMENT TRACKING NO. ########## AGENCY INTEREST NO. 199310

Dear Sir/Madam:

Pursuant to the Louisiana Environmental Quality Act (La. R.S. 30:2001, *et seq.*), the attached **ADMINISTRATIVE ORDER ON CONSENT** is hereby served on **DENKA PERFORMANCE ELASTOMER LLC (RESPONDENT)**.

Any questions concerning this action should be directed to Enforcement Contact Name at Phone Number.

Sincerely,

Celena J. Cage
Administrator
Enforcement Division

CJC//
Alt ID No. #######
Attachment

cc: Respondent's Name & Address

STATE OF LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY

OFFICE OF ENVIRONMENTAL COMPLIANCE

IN THE MATTER OF	*	
	*	
DENKA PERFORMANCE	*	
ELASTOMER LLC	*	
	*	**ENFORCEMENT TRACKING NO.**
ST. JOHN THE BAPTIST PARISH	*	
ALT ID NO. ##########	*	
	*	
	*	**AGENCY INTEREST NO.**
	*	
PROCEEDINGS UNDER THE LOUISIANA	*	**199310**
ENVIRONMENTAL QUALITY ACT,	*	
La. R.S. 30:2001, ET SEQ.	*	

ADMINISTRATIVE ORDER ON CONSENT

The following **ADMINISTRATIVE ORDER ON CONSENT** (AOC) is issued this day to **DENKA PERFORMANCE ELASTOMER LLC (RESPONDENT)** by the Louisiana Department of Environmental Quality (the Department), under the authority granted by the Louisiana Environmental Quality Act (the Act), La. R.S. 30:2001, *et seq.*, and particularly by La. R.S. 30:2011(D)(6) and (D)(14). The Respondent consents to the requirements set forth below.

FINDINGS OF FACT

I.

From November 1, 2015 to the present, Respondent has operated the Pontchartrain Works Facility located in St. John the Baptist Parish, Louisiana (the Facility).

II.

E.I. DuPont de Nemours and Company (DuPont) owns the tracts of land upon which the Facility is located. Pursuant to a Ground Lease with an effective date of November 1, 2015, Respondent leases the tracts of land upon which the Facility is located from DuPont.

III.

The Facility currently operates under Air Permit No. 3000-V5, issued September 9, 2014 (Chloroprene Unit); Air Permit No. 2249-V8, issued on June 15, 2015 (Neoprene Unit); and Air Permit No. 206-V3, issued June 18, 2015 (HCl Recovery Unit).

IV.

On December 17, 2015, the Environmental Protection Agency (EPA) published the 2011 National Air Toxics Assessment (2011 NATA). As a result of the 2011 NATA, Respondent has voluntarily agreed to install certain chloroprene emission controls at the Facility as set forth herein, and has voluntarily entered into this ADMINISTRATIVE ORDER ON CONSENT (AOC).

V.

Respondent has agreed to take the actions listed in this Order as measures that are intended to reduce chloroprene emissions from the Facility. These measures include the installation of certain chloroprene emission controls at the Facility, as set forth herein. The measures described in the Order section below are designed to reduce actual chloroprene emissions at the Facility by 85%. Reference to actual chloroprene emissions reductions in this order shall mean a reduction in actual emissions from baseline emissions reported by the Respondent in its 2015 emissions inventory (reflecting 2014 emissions). The Respondent shall continue to evaluate measures to further reduce chloroprene emissions during the effective time period of this AOC.

ADMINISTRATIVE ORDER

Based on the foregoing, the Department **hereby orders**, and the Respondent hereby **agrees** as follows:

I.

A. Respondent shall install and operate a brine condenser on the Poly Kettles Vent (Emission Point ID 1700-3) in series with the existing chilled water condenser. This project shall be completed by the end of the 1st calendar quarter of 2017. Upon completion and operation, this project shall achieve a reduction of actual emissions of chloroprene by approximately 47 - 50 percent of chloroprene emissions from this emission point, excepting startup, shutdown, and malfunction ~~emissions.~~emissions from the brine condenser.

B. Respondent shall install and operate a vacuum pump and brine condenser on the CD Refining Column (Emission Point ID 1700-20 and 1700-20-A). This project shall be completed by the end of the 2nd calendar quarter of 2017. Upon completion and operation, this project shall achieve a reduction of actual emissions of chloroprene by approximately 95~~%~~ percent of chloroprene emissions from this emission point, excepting startup, shutdown and malfunction emissions from the brine condenser.

C. Respondent shall route the following emissions sources for combustion in the HCl Unit to achieve approximately 99~~%~~percent reduction in actual chloroprene emissions, excepting startup, shutdown, and malfunction emissions from the HCl unit. Respondent shall install the closed vent system and route the streams identified below to the HCl Unit by the end of the 3rd calendar quarter of 2017.

1) The following chloroprene emission sources, as identified in Permit No. 2249-V8 and Permit No. 206-V3, shall be routed to the HCl Unit:

- 1110-2 Refining Jets Vent System
- 1110-4 CD Vent Condenser
- 1110-3 Isom Reactor Vent System
- 1140-20 Aqueous Storage Vent Condenser

- 1110-4B Catalyst Sludge Receiver.
- 7000-17 HCl Feed Tanks Vent
- 2-74 Waste Storage Tanks' Condenser

D. Respondent shall install and operate it thereafter, a Regenerative Thermal Oxidizer (RTO) by the end of the 4th calendar quarter of 2017. The RTO shall achieve at least a 98 percent DRE, excepting startup, shutdown and malfunction ~~emissions~~emissions from the RTO.

1) The following chloroprene emission sources, as identified in Permit No. 2249-V8, shall be controlled by routing them for combustion to the RTO:

- 1700-27 East Hot Dryer Exhaust
- 1700-28 West Hot Dryer Exhaust
- 1700-13A Poly Kettles Manholes/Strainers (3,4 & 5) Common Vent
- 1700-13 Poly Kettles Manholes/Strainers (1 & 2) Common Vent
- 1700-1 No. 7, 8, 10, 13, 14 Emulsion Storage Tanks Manhole & Exhaust Blower
- 1700-5A No. 6 Emulsion Storage Tank Manhole
- 1700-2 Strippers Condenser Vent
- 1700-21A 2 MM lb Tank
- 1700-5 Unstripped Emulsion Storage Tanks
- 1700-51 ~~5~~Inhibitor Mix Tank
- 1700-56 No. 6, 7, 8, 10, 13 & 14 Unstripped Storage Tanks Depressure Vent
- 1700-63 1712 Building common vent header system
- 1700-3 Poly Kettles Vent Condenser
- 1700-20 CD Refining Column Jet
- 1700-20A CD Refining Column Jet (Spare), and
- 1700-90 Refined CD Systems Common Vent

2) Within one hundred twenty (120) days of installation, Respondent shall conduct performance tests to demonstrate the 98 percent DRE, using a performance test plan to be approved by the Department. Respondent shall submit a proposed plan to the Department for the performance test by no later than 30 days prior to the test.

3) This subparagraph D shall be superseded and shall be of no further force should Respondent and the EPA enter into a court approved, federal Consent Decree requiring the installation, operation, testing, and permitting of an RTO at the Facility.

E. By August 1, 2017, Respondent shall submit a final plan to reduce actual chloroprene emissions reductions from the 1700-66 Poly Building Wall Fans and 4-95 Stripper Wastewater and Associated Aeration tank(s) by at least 50%.

F. For each project, Respondent shall submit monthly progress report on or before the fifteenth day of each month after this AOC is issued. Each monthly progress report shall include a brief summary of the status of the projects required by this AOC and issues that may affect the installation schedule. Submission of these reports shall continue until such time as these emission reduction efforts are installed and are operating.

G. Respondent shall submit semi-annual reports on June 30, 2017~~, and~~, and December 30,~~,~~ 2017, on the efforts to evaluate further chloroprene emissions reductions at the facility in addition to those emission reductions required by this Order during its effective time period.

H. Respondent shall continue to conduct ambient air quality monitoring until six (6) months after the startup of the RTO, pursuant to the monitoring plan approved by the Department on June 28, 2016 and at the West Bank monitoring site in Edgard, Louisiana, or pursuant to any subsequent monitoring plan submitted by the Respondent and approved by the Department.

II.

A. The deadlines described in Paragraph I may be extended by any time delays occasioned by Force Majeure. "Force Majeure," for purposes of this AOC, is defined as any event arising from causes beyond the reasonable control of Respondent, of any entity controlled by Respondent, or of Respondent's contractors, that delays or prevents the performance of any obligation under this AOC despite Respondent's best commercially reasonable efforts, as agreed upon by the Department and Respondent, to fulfill the obligation. The requirement that Respondent exercise best commercially reasonable efforts, as agreed upon by the Department and Respondent, to fulfill the obligation includes using best commercially reasonable efforts to anticipate any potential force majeure event and best commercially reasonable efforts to address the effects of any such event (a) as it is occurring and (b) after it has occurred to prevent or minimize any resulting delay to the greatest extent possible. Force Majeure does not include Respondent's financial inability to perform any obligation under this AOC.

B. If any event occurs or has occurred that will delay the performance of any obligation under this AOC, whether or not caused by a force majeure event, Respondent shall provide notice orally or by electronic or facsimile transmission to the LDEQ, within three (3) working days of when Respondent first knew that the event might cause a delay. Within fourteen (14) days thereafter, Respondent shall provide in writing to the LDEQ an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; and Respondent's rationale for attributing such delay to a force majeure event if it intends to assert such a claim. Respondent shall include with any notice all available documentation supporting the claim that the delay was attributable to a force majeure. Failure to comply with the above requirements shall preclude Respondent from asserting any claim of force majeure for that event for the period of time of such failure to comply, and for any additional delay caused by such failure. Respondent shall be deemed to know of any circumstance of which Respondent, any entity controlled by Respondent, or Respondents' contractors knew or should have known.

III.

Respondent shall in good faith seek all necessary permits and agency consents to construct and operate the emission control measures set forth in Paragraph I (including but not limited to all necessary permits from the Department, the EPA, the Corps of Engineers, or similar authority). However, the failure of any administrative agency to provide a decision on necessary permits or consents in advance of any deadline set by this Order, despite Respondent's submission of a timely and administratively complete application, shall extend the applicable deadlines in this Order by any time delays occasioned by such failure of agencies to provide a decision on necessary consents or permits. Further, any time delays occasioned by any suspension of any necessary consents or permits resulting from any administrative or judicial proceedings brought by third parties shall extend the applicable deadlines occasioned by the administrative and/or judicial proceeding.

IV.

The Department and Respondent may, by written mutual agreement, modify the emission control measures and schedules required under Paragraph I.

V.

To the extent required by law, further proceedings relating to this **ADMINISTRATIVE ORDER ON CONSENT will** be governed by the Louisiana Environmental Quality Act, LA. R.S. 30:2001, *et seq.,* and the Administrative Procedure Act, La. R.S. 49.950, *et seq*.

VI.

This **ADMINISTRATIVE ORDER ON CONSENT (AOC)** may be executed in counterparts, each of which may be executed by one or more of the signatory parties hereto. Signature pages may be detached from the counterparts and attached to one or more copies of this Agreement to form multiple legally effective documents. Facsimile signatures shall be sufficient in lieu of original signatures.

VII.

The Department reserves the right to seek compliance with its rules and regulations in any manner allowed by law, and nothing herein shall be construed to preclude the right to seek compliance. The Department reserves all legal and equitable remedies and authorities to seek emission reductions in addition to those specified in this AOC.

VIII.

In any subsequent administrative or judicial proceeding initiated by the Department or the United States for injunctive relief, civil penalties, other appropriate relief relating to the Facility, Respondent shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estopped, issue preclusion, claim preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the Department or the United States in the subsequent proceeding were or should have been addressed in this AOC.

IX.

This AOC is not a permit, or a modification of any permit, under any federal, state, or local laws or regulations. Respondent is responsible for achieving and maintaining complete compliance with all applicable federal, state, and local laws, regulations, and permits, and Respondent's compliance with this AOC shall be no defense to any action commenced pursuant to any such laws, regulations, or permits. The Department does not, by its consent to the entry of this AOC, warrant or aver in any manner that Respondent's compliance with any aspect of this AOC will result in compliance with provisions of the Louisiana Environmental Quality Act or the Clean Air Act, 42 U.S.C. § 7401, et seq., or with any other provision of federal, State, or local laws, regulations, or permits.

X.

This AOC does not limit or affect the rights of Respondent against any third parties, not party to this AOC, nor does it limit the rights of third parties, including, but not limited to the United States, not party to this AOC, against Respondent, except as otherwise provided by law.

XI.

Nothing contained herein and no actions taken by Respondent with regard to this **ADMINISTRATIVE ORDER ON CONSENT** shall constitute an admission by Respondent to any fact, claim, liability, or defense.

XII.

Nothing contained herein and no actions taken by Respondent with regard to this **ADMINISTRATIVE ORDER ON CONSENT** shall constitute an admission by Respondent as to the correctness of or Respondent's agreement with the 2011 NATA or the Integrated Risk Information System (IRIS) inhalation unit risk estimate set out in EPA's IRIS 2010 Toxicological Review of Chloroprene.

XIII.

This **AOC** shall remain in force and effect until such time as ~~a~~the operating permit(s) ~~permit~~ has been modified and/or issued to incorporate the emission reduction measures in this AOC and the air quality monitoring of Paragraph I.H is complete.

THE RESPONDENT SHALL FURTHER BE ON NOTICE THAT:

This **ADMINISTRATIVE ORDER ON CONSENT** shall be final and effective upon signature by an authorized representative of the Department and signature by the authorized representative of the Respondent.

Baton Rouge, Louisiana, this _____ day of ____________________________________ , 201~~6~~7.

____
~~Lourdes Iturralde~~
Chuck Carr Brown, Ph.D.
~~Assistant~~ Secretary
Louisiana Department of Environmental Quality~~Office of Environmental Compliance~~

DENKA PERFORMANCE ELASTOMER LLC

By: ____________________________________ **Date:** ____________________________

Name: ________________________________

Title: _________________________________

Message

From: Ted Broyles [Ted.Broyles@LA.GOV]
Sent: 1/3/2017 6:56:24 PM
To: Lannen, Justin [Lannen.Justin@epa.gov]; robyn.hanson@usdoj.gov [Robyn.Hanson@usdoj.gov]; Caballero, Kathryn [Caballero.Kathryn@epa.gov]; Spina, Providence [Spina.Providence@epa.gov]; Osbourne, Margaret [osbourne.margaret@epa.gov]; Welton, Patricia [Welton.Patricia@epa.gov]; Steven D. Shermer (Steven.Shermer@usdoj.gov) [Steven.Shermer@usdoj.gov]
CC: Lourdes Iturralde [Lourdes.Iturralde@LA.GOV]; Robert E. Holden (reholden@liskow.com) [reholden@liskow.com]; herman.robinson@la.gov; Dwana King [Dwana.King@LA.GOV]
Subject: Denka Performance Elastomers AOC
Attachments: Bob Holden response draft 12-29-16 with LDEQ edits.docx

Please find attached the LDEQ response draft to be discussed at 2:00 this afternoon.

This morning, the LDEQ Secretary advised that he is willing to sign the attached AOC. I discussed the draft with Bob Holden and have copied Bob on this email. The secretary understands the governments have a call this afternoon.

TED R. BROYLES, II
Attorney III
Enforcement and Remediation

DEQ LOUISIANA

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF THE SECRETARY
Legal Division
P.O. Box 4302
Baton Rouge, LA 70821-4302
225.219.3985–Office
225.219.4068–Facsimile

CERTIFIED MAIL
(############) RETURN
RECEIPT REQUESTED

DENKA PERFORMANCE ELASTOMER LLC
c/o Name of Agent
Agent for Service of Process
Service Address
Service Address

RE: ADMINISTRATIVE ORDER ON CONSENT ENFORCEMENT TRACKING NO. ########## AGENCY INTEREST NO. 199310

Dear Sir/Madam:

Pursuant to the Louisiana Environmental Quality Act (La. R.S. 30:2001, *et seq.*), the attached **ADMINISTRATIVE ORDER ON CONSENT** is hereby served on **DENKA PERFORMANCE ELASTOMER LLC (RESPONDENT)**.

Any questions concerning this action should be directed to Enforcement Contact Name at Phone Number.

Sincerely,

Celena J. Cage
Administrator
Enforcement Division

CJC//
Alt ID No. #######
Attachment

cc: Respondent's Name & Address

STATE OF LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY

OFFICE OF ENVIRONMENTAL COMPLIANCE

IN THE MATTER OF	*	
	*	
DENKA PERFORMANCE	*	
ELASTOMER LLC	*	
	*	**ENFORCEMENT TRACKING NO.**
ST. JOHN THE BAPTIST PARISH	*	
ALT ID NO. ##########	*	
	*	
	*	**AGENCY INTEREST NO.**
	*	
PROCEEDINGS UNDER THE LOUISIANA	*	**199310**
ENVIRONMENTAL QUALITY ACT,	*	
La. R.S. 30:2001, ET SEQ.	*	

ADMINISTRATIVE ORDER ON CONSENT

The following **ADMINISTRATIVE ORDER ON CONSENT** (AOC) is issued this day to **DENKA PERFORMANCE ELASTOMER LLC (RESPONDENT)** by the Louisiana Department of Environmental Quality (the Department), under the authority granted by the Louisiana Environmental Quality Act (the Act), La. R.S. 30:2001, *et seq*., and particularly by La. R.S. 30:2011(D)(6) and (D)(14). The Respondent consents to the requirements set forth below.

FINDINGS OF FACT

I.

From November 1, 2015 to the present, Respondent has operated the Pontchartrain Works Facility located in St. John the Baptist Parish, Louisiana (the Facility).

II.

E.I. DuPont de Nemours and Company (DuPont) owns the tracts of land upon which the Facility is located. Pursuant to a Ground Lease with an effective date of November 1, 2015, Respondent leases the tracts of land upon which the Facility is located from DuPont.

III.

The Facility currently operates under Air Permit No. 3000-V5, issued September 9, 2014 (Chloroprene Unit); Air Permit No. 2249-V8, issued on June 15, 2015 (Neoprene Unit); and Air Permit No. 206-V3, issued June 18, 2015 (HCl Recovery Unit).

IV.

On December 17, 2015, the Environmental Protection Agency (EPA) published the 2011 National Air Toxics Assessment (2011 NATA). As a result of the 2011 NATA, Respondent has voluntarily agreed to install certain chloroprene emission controls at the Facility as set forth herein, and has voluntarily entered into this ADMINISTRATIVE ORDER ON CONSENT (AOC).

V.

Respondent has agreed to take the actions listed in this Order as measures that are intended to reduce chloroprene emissions from the Facility. These measures include the installation of certain chloroprene emission controls at the Facility, as set forth herein. The measures described in the Order section below are designed to reduce actual chloroprene emissions at the Facility by 85%. Reference to actual chloroprene emissions reductions in this order shall mean a reduction in actual emissions from baseline emissions reported by the Respondent in its 2015 emissions inventory (reflecting 2014 emissions). The Respondent shall continue to evaluate measures to further reduce chloroprene emissions during the effective time period of this AOC.

ADMINISTRATIVE ORDER

Based on the foregoing, the Department **hereby orders**, and the Respondent hereby **agrees** as follows:

I.

A. Respondent shall install and operate a brine condenser on the Poly Kettles Vent (Emission Point ID 1700-3) in series with the existing chilled water condenser. This project shall be completed by the end of the 1st calendar quarter of 2017. Upon completion and operation, this project shall achieve a reduction of actual emissions of chloroprene by approximately 47 - 50 percent of chloroprene emissions from this emission point, excepting startup, shutdown, and malfunction emissions.

B. Respondent shall install and operate a vacuum pump and brine condenser on the CD Refining Column (Emission Point ID 1700-20 and 1700-20-A). This project shall be completed by the end of the 2nd calendar quarter of 2017. Upon completion and operation, this project shall achieve a reduction of actual emissions of chloroprene by approximately 95% of chloroprene emissions from this emission point, excepting startup, shutdown and malfunction emissions.

C. Respondent shall route the following emissions sources for combustion in the HCl Unit to achieve approximately 99% reduction in actual chloroprene emissions, excepting startup, shutdown, and malfunction emissions. Respondent shall install the closed vent system and route the streams identified below to the HCl Unit by the end of the 3rd calendar quarter of 2017.

1) The following chloroprene emission sources, as identified in Permit No. 2249-V8 and Permit No. 206-V3, shall be routed to the HCl Unit:

- 1110-2 Refining Jets Vent System
- 1110-4 CD Vent Condenser
- 1110-3 Isom Reactor Vent System
- 1140-20 Aqueous Storage Vent Condenser

- 1110-4B Catalyst Sludge Receiver.
- 7000-17 HCl Feed Tanks Vent
- 2-74 Waste Storage Tanks' Condenser

D. Respondent shall install and operate it thereafter, a Regenerative Thermal Oxidizer (RTO) by the end of the 4th calendar quarter of 2017. The RTO shall achieve at least a 98 percent DRE, excepting startup, shutdown and malfunction emissions.

1) The following chloroprene emission sources, as identified in Permit No. 2249-V8, shall be controlled by routing them for combustion to the RTO:

- 1700-27 East Hot Dryer Exhaust
- 1700-28 West Hot Dryer Exhaust
- 1700-13A Poly Kettles Manholes/Strainers (3,4 & 5) Common Vent
- 1700-13 Poly Kettles Manholes/Strainers (1 & 2) Common Vent
- 1700-1 No. 7, 8, 10, 13, 14 Emulsion Storage Tanks Manhole & Exhaust Blower
- 1700-5A No. 6 Emulsion Storage Tank Manhole
- 1700-2 Strippers Condenser Vent
- 1700-21A 2 MM lb Tank
- 1700-5 Unstripped Emulsion Storage Tanks
- 1700-1 5Inhibitor Mix Tank
- 1700-56 No. 6, 7, 8, 10, 13 & 14 Unstripped Storage Tanks Depressure Vent
- 1700-63 1712 Building common vent header system
- 1700-3 Poly Kettles Vent Condenser
- 1700-20 CD Refining Column Jet
- 1700-20A CD Refining Column Jet (Spare), and
- 1700-90 Refined CD Systems Common Vent

2) Within one hundred twenty (120) days of installation, Respondent shall conduct performance tests to demonstrate the 98 percent DRE, using a performance test plan to be approved by the Department. Respondent shall submit a proposed plan to the Department for the performance test by no later than 30 days prior to the test.

3) This subparagraph D shall be superseded and shall be of no further force should Respondent and the EPA enter into a court approved, federal Consent Decree requiring the installation, operation, testing, and permitting of an RTO at the Facility.

E. By August 1, 2017, Respondent shall submit a final plan to reduce actual chloroprene emissions reductions from the 1700-66 Poly Building Wall Fans and 4-95 Stripper Wastewater and Associated Aeration tank(s) by at least 50%.

F. For each project, Respondent shall submit monthly progress report on or before the fifteenth day of each month after this AOC is issued. Each monthly progress report shall include a brief summary of the status of the projects required by this AOC and issues that may affect the installation schedule. Submission of these reports shall continue until such time as these emission reduction efforts are installed and are operating.

G. Respondent shall submit semi-annual reports on June 30, 2017~~, and~~, and December 30, 2017, on the efforts to evaluate further chloroprene emissions reductions at the facility in addition to those emission reductions required by this Order during its effective time period.

H. Respondent shall continue to conduct ambient air quality monitoring until six (6) months after the startup of the RTO, pursuant to the monitoring plan approved by the Department on June 28, 2016 and at the West Bank monitoring site in Edgard, Louisiana, or pursuant to any subsequent monitoring plan submitted by the Respondent and approved by the Department.

II.

A. The deadlines described in Paragraph I may be extended by any time delays occasioned by Force Majeure. "Force Majeure," for purposes of this AOC, is defined as any event arising from causes beyond the reasonable control of Respondent, of any entity controlled by Respondent, or of Respondent's contractors, that delays or prevents the performance of any obligation under this AOC despite Respondent's best commercially reasonable efforts, as agreed upon by the Department and Respondent, to fulfill the obligation. The requirement that Respondent exercise best commercially reasonable efforts, as agreed upon by the Department and Respondent, to fulfill the obligation" includes using best commercially reasonable efforts to anticipate any potential force majeure event and best commercially reasonable efforts to address the effects of any such event (a) as it is occurring and (b) after it has occurred to prevent or minimize any resulting delay to the greatest extent possible. Force Majeure does not include Respondent's financial inability to perform any obligation under this AOC.

B. If any event occurs or has occurred that will delay the performance of any obligation under this AOC, whether or not caused by a force majeure event, Respondent shall provide notice orally or by electronic or facsimile transmission to the LDEQ, within three (3) working days of when Respondent first knew that the event might cause a delay. Within fourteen (14) days thereafter, Respondent shall provide in writing to the LDEQ an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; and Respondents' rationale for attributing such delay to a force majeure event if it intends to assert such a claim. Respondent shall include with any notice all available documentation supporting the claim that the delay was attributable to a force majeure. Failure to comply with the above requirements shall preclude Respondent from asserting any claim of force majeure for that event for the period of time of such failure to comply, and for any additional delay caused by such failure. Respondent shall be deemed to know of any circumstance of which Respondent, any entity controlled by Respondent, or Respondents' contractors knew or should have known.

III.

Respondent shall in good faith seek all necessary permits and agency consents to construct and operate the emission control measures set forth in Paragraph I (including but not limited to all necessary permits from the Department, the EPA, the Corps of Engineers, or similar authority). However, the failure of any administrative agency to provide a decision on necessary permits or consents in advance of any deadline set by this Order, despite Respondent's submission of timely and administratively complete application, shall extend the applicable deadlines in this Order by any time delays occasioned by such failure of agencies to provide a decision on necessary consents or permits. Further, any time delays occasioned by any suspension of any necessary consents or permits resulting from any administrative or judicial proceedings brought by third parties shall extend the applicable deadlines occasioned by the administrative and/or judicial proceeding.

IV.

The Department and Respondent may, by written mutual agreement, modify the emission control measures and schedules required under Paragraph I.

V.

To the extent required by law, further proceedings relating to this **ADMINISTRATIVE ORDER ON CONSENT will** be governed by the Louisiana Environmental Quality Act, LA. R.S. 30:2001, *et seq.,* and the Administrative Procedure Act, La. R.S. 49.950, *et seq*.

VI.

This **ADMINISTRATIVE ORDER ON CONSENT (AOC)** may be executed in counterparts, each of which may be executed by one or more of the signatory parties hereto. Signature pages may be detached from the counterparts and attached to one or more copies of this Agreement to form multiple legally effective documents. Facsimile signatures shall be sufficient in lieu of original signatures.

VII.

The Department reserves the right to seek compliance with its rules and regulations in any manner allowed by law, and nothing herein shall be construed to preclude the right to seek compliance. The Department reserves all legal and equitable remedies and authorities to seek emission reductions in addition to those specified in this AOC.

VIII.

In any subsequent administrative or judicial proceeding initiated by the Department or the United States for injunctive relief, civil penalties, other appropriate relief relating to the Facility, Respondent shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estopped, issue preclusion, claim preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the Department or the United States in the subsequent proceeding were or should have been addressed in this AOC.

IX.

This AOC is not a permit, or a modification of any permit, under any federal, state, or local laws or regulations. Respondent is responsible for achieving and maintaining complete compliance with all applicable federal, state, and local laws, regulations, and permits, and Respondent's compliance with this AOC shall be no defense to any action commenced pursuant to any such laws, regulations, or permits. The Department does not, by its consent to the entry of this AOC, warrant or aver in any manner that Respondent's compliance with any aspect of this AOC will result in compliance with provisions of the Louisiana Environmental Quality Act or the Clean Air Act, 42 U.S.C. § 7401, et seq., or with any other provision of federal, State, or local laws, regulations, or permits.

X.

This AOC does not limit or affect the rights of Respondent against any third parties, not party to this AOC, nor does it limit the rights of third parties, including, but not limited to the United States, not party to this AOC, against Respondent, except as otherwise provided by law.

XI.

Nothing contained herein and no actions taken by Respondent with regard to this **ADMINISTRATIVE ORDER ON CONSENT** shall constitute an admission by Respondent to any fact, claim, liability, or defense.

XII.

Nothing contained herein and no actions taken by Respondent with regard to this **ADMINISTRATIVE ORDER ON CONSENT** shall constitute an admission by Respondent as to the correctness of or Respondent's agreement with the 2011 NATA or the Integrated Risk Information System (IRIS) inhalation unit risk estimate set out in EPA's IRIS 2010 Toxicological Review of Chloroprene.

XIII.

This **AOC** shall remain in force and effect until such time as a permit has been modified and/or issued to incorporate the emission reduction measures in this AOC.

THE RESPONDENT SHALL FURTHER BE ON NOTICE THAT:

This **ADMINISTRATIVE ORDER ON CONSENT** shall be final and effective upon signature by an authorized representative of the Department and signature by the authorized representative of the Respondent.

Baton Rouge, Louisiana, this _____ day of ____________________________________ , 2016.

____
Lourdes Iturralde
Assistant Secretary
Office of Environmental Compliance

DENKA PERFORMANCE ELASTOMER LLC

By: ___________________________________ **Date:** ___________________________

Name: ________________________________

Title: ________________________________

Message

From: Shermer, Steven (ENRD) [Steven.Shermer@usdoj.gov]
Sent: 12/22/2016 10:01:33 PM
To: Lannen, Justin [Lannen.Justin@epa.gov]; Ted Broyles [Ted.Broyles@LA.GOV]
CC: robyn.hanson@usdoj.gov [Robyn.Hanson@usdoj.gov]; Spina, Providence [Spina.Providence@epa.gov]
Subject: Denka - 12-22-16 post call revised draft AOC
Attachments: DOJ and R6 comments post-12-22 call.docx

Guys – in the interest of trying to keep the pace on this one (and doing you a solid), I've revised the EPA R6 afternoon version of the draft order based on my notes. Double check me since I wasn't keeping meticulous notes. There's a spot or two to fill in with information, like the name and date of the ambient air quality monitoring plan. But, that should be pretty apparent.

I'll be checking email occasionally tomorrow. Let me know if you have questions with what I did here.

Steve

Steven D. Shermer
Senior Attorney
Environmental Enforcement Section
United States Department of Justice
Regular Mail: P.O. Box 7611
Washington, D.C. 20044-7611
Express Mail: ENRD Mailroom
Room 2121, 601 D St., N.W.
Washington, D.C. 20004
202-514-1134 (office)
202-616-6584 (fax)

Message

From: Payne, James [payne.james@epa.gov]
Sent: 12/14/2016 4:26:08 PM
To: herman.robinson@la.gov
CC: Lannen, Justin [Lannen.Justin@epa.gov]; Welton, Patricia [Welton.Patricia@epa.gov]; Seager, Cheryl [Seager.Cheryl@epa.gov]
Subject: Fwd: EPA Proposed Edits to Denka AOC
Attachments: EPA comments on DPE's draft AOC_NO LDEQ comments provided_FINAL.docx; ATT00001.htm

Hi Herman. Ensuring you have this too. I believe Justin is in close contact with Ted on this. Jim 214-665-8170

Sent from my iPhone

Begin forwarded message:

> **From:** "Thompson, Steve" <thompson.steve@epa.gov>
> **Date:** December 14, 2016 at 10:00:04 AM CST
> **To:** " (Lourdes.Iturralde@LA.GOV)" <Lourdes.Iturralde@LA.GOV>
> **Cc:** "Dwyer, Stacey" <Dwyer.Stacey@epa.gov>, "Payne, James" <payne.james@epa.gov>, "Stenger, Wren" <stenger.wren@epa.gov>
> **Subject: EPA Proposed Edits to Denka AOC**
>
> Lourdes,
> Here are our comments to the AOC with changes tracked. I think it would be great for us to have a quick call for us to go over our recommended changes. Let me know if you all have time today and I can work to coordinate a call on our end.
> Thanks,
> Steve
>
> Steve Thompson
> Branch Chief
> Air Enforcement Branch
> Compliance Assurance and Enforcement Division
> U.S. EPA Region 6
> Dallas,TX 75202
> 214-665-2769
> thompson.steve@epa.gov

Message

From: Shermer, Steven (ENRD) [Steven.Shermer@usdoj.gov]
Sent: 12/9/2016 5:42:13 PM
To: 'Ted Broyles' [Ted.Broyles@LA.GOV]
CC: robyn.hanson@usdoj.gov [Robyn.Hanson@usdoj.gov]; Lannen, Justin [Lannen.Justin@epa.gov]; Caballero, Kathryn [Caballero.Kathryn@epa.gov]
Subject: FW: Denka Performance Elastomer -DPE proposed draft AOC
Attachments: removed.txt; LISKOWDOCS_4545103_1.pdf

Ted – what's LDEQ's process and timeline for reviewing this draft from Denka? Want to make sure we have our 5 days to look over any draft before it gets finalized.

From: Robert E. Holden [mailto:reholden@liskow.com]
Sent: Friday, December 09, 2016 10:41 AM
To: ted.broyles@la.gov; Dwana King (dwana.king@la.gov) <dwana.king@la.gov>; Herman Robinson Esq. (herman.robinson@la.gov) <herman.robinson@la.gov>
Cc: Shermer, Steven (ENRD) <SShermer2@ENRD.USDOJ.GOV>; Lannen, Justin <Lannen.Justin@epa.gov>; Caballero, Kathryn <Caballero.Kathryn@epa.gov>; Hanson, Robyn (ENRD) <RHanson@ENRD.USDOJ.GOV>; Lori E. Sanders (Lori.e.sanders@dupont.com) <Lori.e.sanders@dupont.com>; Eric E. Jarrell (ejarrell@kingkrebs.com) <ejarrell@kingkrebs.com>; Stephen Wiegand <swwiegand@Liskow.com>; Jonathan Martel (jonathan.martel@aporter.com) <jonathan.martel@aporter.com>
Subject: Denka Performance Elastomer -DPE proposed draft AOC

Ted, Dwana and Herman:

On behalf of Denka Performance Elastomer, LLC, please find attached a proposed Administrative Order on Consent for the installation of the interim emission reduction measures. We look forward to discussing this with you shortly.

Bob Holden

(504) 556-4130 Direct
(504) 556-4108 Fax
(504) 813-3049 Cell

New Orleans | **Lafayette** | **Houston**

One Shell Square
701 Poydras Street, Suite 5000
New Orleans, LA 70139
www.liskow.com

Message

From: Thompson, Steve [thompson.steve@epa.gov]
Sent: 12/9/2016 4:07:14 PM
To: (Lourdes.Iturralde@LA.GOV) [Lourdes.Iturralde@LA.GOV]
CC: Lannen, Justin [Lannen.Justin@epa.gov]; Gilrein, Stephen [gilrein.stephen@epa.gov]; Dwyer, Stacey [Dwyer.Stacey@epa.gov]; Leathers, James [Leathers.James@epa.gov]; Osbourne, Margaret [osbourne.margaret@epa.gov]
Subject: FW: Administrative Order on Consent DPE and LDEQ rough draft.docx
Attachments: Administrative Order on Consent DPE and LDEQ rough draft.docx

Lourdes,
As we discussed this morning, attached are our additions and recommendations to your draft AOC. Please let me know if you have any questions or we can assist in any way.

Thanks,
Steve

Message

From: Ted Broyles [Ted.Broyles@LA.GOV]
Sent: 7/23/2018 1:14:59 PM
To: Lannen, Justin [Lannen.Justin@epa.gov]
Subject: Denka Elastomers
Attachments: NOPP Response 07.20.18 (N3630003x7A3A0).pdf

Response from Denka on the Poly Kettle Vent Condenser stack test NOPP. We granted DuPont's request for additional time to respond. DuPont response now due Aug. 1st.

TED R. BROYLES, II
Attorney III
Enforcement and Remediation

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF THE SECRETARY
Legal Division
P.O. Box 4302
Baton Rouge, LA 70821-4302
225.219.3985–Office
225.219.4068–Facsimile

Message

From: Kathleen Aubin [Kathleen.Aubin@LA.GOV]
Sent: 9/11/2017 6:38:28 PM
To: Spina, Providence [Spina.Providence@epa.gov]; yjp8@cdc.gov
CC: Caballero, Kathryn [Caballero.Kathryn@epa.gov]; Pettigrew, George (ATSDR/DCHI/CB) [glp3@cdc.gov]; Lannen, Justin [Lannen.Justin@epa.gov]; Rosalind Green (LDH-OPH) [Rosalind.Green@LA.GOV]; Dianne Dugas [Dianne.Dugas@LA.GOV]; 'White, Luann E' [lawhite@tulane.edu]; Shannon Soileau [Shannon.Soileau@LA.GOV]; Stephen Russo [Stephen.Russo@LA.GOV]; Sandra Jelks [Sandra.Jelks@LA.GOV]
Subject: RE: Questions for Discussion re Denka Health Consultation
Attachments: Panel questions 8-30-17.docx; Chemical Sampling Information _ beta-Chloroprene _ OSHA.PDF; Preliminary Chloroprene Summary FORMATTED 8_25_17.docx; 2017-06-22_Denka7.pdf

Good Afternoon,
As discussed on the call held this morning, please see attached documents which we would like to share with you all regarding the Denka facility.
Thank you,

Kathleen Aubin
Environmental Health Scientist Supervisor
Louisiana Department of Health and Hospitals
Section of Environmental Epidemiology and Toxicology
1450 Poydras St., Suite 1631
New Orleans, La. 70112
Phone # 504-568-8144
Fax #: 504-568-8149
Email: kathleen.aubin@la.gov

From: Spina, Providence [mailto:Spina.Providence@epa.gov]
Sent: Thursday, September 07, 2017 12:09 PM
To: Kathleen Aubin; yjp8@cdc.gov
Cc: Caballero, Kathryn; Pettigrew, George (ATSDR/DCHI/CB); Lannen, Justin; June Sutherlin; Jimmy Guidry (LDH); Parham Jaberi; Beth Scalco; DeAnn Gruber; Rosalind Green (LDH-OPH); Dianne Dugas; 'White, Luann E'; Shannon Soileau
Subject: Questions for Discussion re Denka Health Consultation

Thank you, Kathleen, for the clarification on the work being conducted. It's a very helpful starting point for our conversation on Monday, which we view as an opportunity to generally learn the basics about the health consultation. Below are some questions to guide and structure Monday's discussion:

- What event or mandate precipitated the health consultation? Are health consultations fairly routine, or was it mandated by statute, or perhaps a response to specific circumstances?
- What data and information are being compiled?
- What are the expected outcomes or findings of the consultation? What does it mean to interpret the information in relation to public health?
- Is there a timeline for the consultation to be completed?
- We understand that the Louisiana Department of Health has a cooperative agreement with ATSDR under the APPLETREE Program, but that the current consultation is not being conducted within that framework, i.e., it is separate from and independent of the Department of Health's cooperative work with ATSDR. Does the state anticipate any ATSDR involvement with this consultation?

We very much appreciate your taking the time to speak with us.

Please let me know if you have any questions in advance of our call on Monday.

Regards,

Providence Spina
202-564-2722

From: Kathleen Aubin [mailto:Kathleen.Aubin@LA.GOV]
Sent: Thursday, September 07, 2017 9:19 AM
To: Spina, Providence <Spina.Providence@epa.gov>; yjp8@cdc.gov
Cc: Caballero, Kathryn <Caballero.Kathryn@epa.gov>; Pettigrew, George (ATSDR/DCHI/CB) <glp3@cdc.gov>; Lannen, Justin <Lannen.Justin@epa.gov>; June.Sutherlin@la.gov; Jimmy Guidry (LDH) <Jimmy.Guidry2@LA.GOV>; Parham Jaberi <Parham.Jaberi@LA.GOV>; Beth Scalco <Beth.Scalco@LA.GOV>; DeAnn Gruber <DeAnn.Gruber@LA.GOV>; Rosalind Green (LDH-OPH) <Rosalind.Green@LA.GOV>; Dianne Dugas <Dianne.Dugas@LA.GOV>; 'White, Luann E' <lawhite@tulane.edu>; Shannon Soileau <Shannon.Soileau@LA.GOV>
Subject: RE: EPA introduction re: Denka

Good Morning Providence,

Yes, please send questions to us prior to the call. We just want to inform you that this is **not** a study. We are compiling information and trying to determine how to interpret it in relation to public health.
Thank you,

Kathleen Aubin
Environmental Health Scientist Supervisor
Louisiana Department of Health and Hospitals
Section of Environmental Epidemiology and Toxicology
1450 Poydras St., Suite 1631
New Orleans, La. 70112
Phone # 504-568-8144
Fax #: 504-568-8149
Email: kathleen.aubin@la.gov

From: Spina, Providence [mailto:Spina.Providence@epa.gov]
Sent: Thursday, September 07, 2017 8:15 AM
To: Kathleen Aubin; yjp8@cdc.gov
Cc: Caballero, Kathryn; Pettigrew, George (ATSDR/DCHI/CB); Lannen, Justin; June Sutherlin; Jimmy Guidry (LDH); Parham Jaberi; Beth Scalco; DeAnn Gruber; Rosalind Green (LDH-OPH); Dianne Dugas; 'White, Luann E'; Shannon Soileau
Subject: RE: EPA introduction re: Denka

Thank you, Kathleen. I will send a calendar invitation and conference call number to everyone copied on this email. We will also send a list of questions before the call – we generally are interested in just learning more about the study, but I will send questions to help guide the discussion.

Many thanks for your making the time,

Providence Spina
202-564-2722

From: Kathleen Aubin [mailto:Kathleen.Aubin@LA.GOV]
Sent: Wednesday, September 06, 2017 5:02 PM
To: Spina, Providence <Spina.Providence@epa.gov>; yjp8@cdc.gov
Cc: Caballero, Kathryn <Caballero.Kathryn@epa.gov>; Pettigrew, George (ATSDR/DCHI/CB) <glp3@cdc.gov>; Lannen, Justin <Lannen.Justin@epa.gov>; June.Sutherlin@la.gov; Jimmy Guidry (LDH) <Jimmy.Guidry2@LA.GOV>; Parham Jaberi <Parham.Jaberi@LA.GOV>; Beth Scalco <Beth.Scalco@LA.GOV>; DeAnn Gruber <DeAnn.Gruber@LA.GOV>; Rosalind Green (LDH-OPH) <Rosalind.Green@LA.GOV>; Dianne Dugas <Dianne.Dugas@LA.GOV>; 'White, Luann E' <lawhite@tulane.edu>; Shannon Soileau <Shannon.Soileau@LA.GOV>
Subject: RE: EPA introduction re: Denka

Good Afternoon,
We are available for a conference call on Monday, September 11 at 10:00 am (CST). Please let us know your questions/concerns prior to the scheduled call.
Thank you,

Kathleen Aubin
Environmental Health Scientist Supervisor
Louisiana Department of Health and Hospitals
Section of Environmental Epidemiology and Toxicology
1450 Poydras St., Suite 1631
New Orleans, La. 70112
Phone # 504-568-8144
Fax #: 504-568-8149
Email: kathleen.aubin@la.gov

From: Spina, Providence [mailto:Spina.Providence@epa.gov]
Sent: Wednesday, September 06, 2017 3:12 PM
To: yjp8@cdc.gov; Kathleen Aubin
Cc: Caballero, Kathryn; Pettigrew, George (ATSDR/DCHI/CB); Lannen, Justin
Subject: RE: EPA introduction re: Denka

Thank you, Eva and Kathleen.

Kathleen, as Eva mentioned, we are hoping to learn more about the Denka-related health consultation that we understand is currently underway at the Louisiana Department of Health. Is there a convenient time in the next couple of days that we could ask some questions?

Here are some windows that my colleagues and I are available:

- Tomorrow, Sept. 7, 11 AM EST/10 AM CST
- Monday, Sept. 11
    - 11 AM EST/10 AM CST
    - 3 PM EST/2 PM EST
- Tuesday, Sept. 12, 3:30 PM EST/2:30 PM EST

We understand that you are probably very busy with hurricane-related relief work, so we appreciate any time that you can spare. If none of these windows are convenient for you, please let us know and we will move things around to find a good time.

Many thanks,

Providence

Providence Spina
202-564-2722

From: McLanahan, Eva (ATSDR/DCHI/OD) [mailto:yjp8@cdc.gov]
Sent: Wednesday, September 06, 2017 3:48 PM
To: Kathleen Aubin (kathleen.aubin@la.gov) <kathleen.aubin@la.gov>
Cc: Spina, Providence <Spina.Providence@epa.gov>; Caballero, Kathryn <Caballero.Kathryn@epa.gov>; Pettigrew, George (ATSDR/DCHI/CB) <glp3@cdc.gov>
Subject: EPA introduction re: Denka

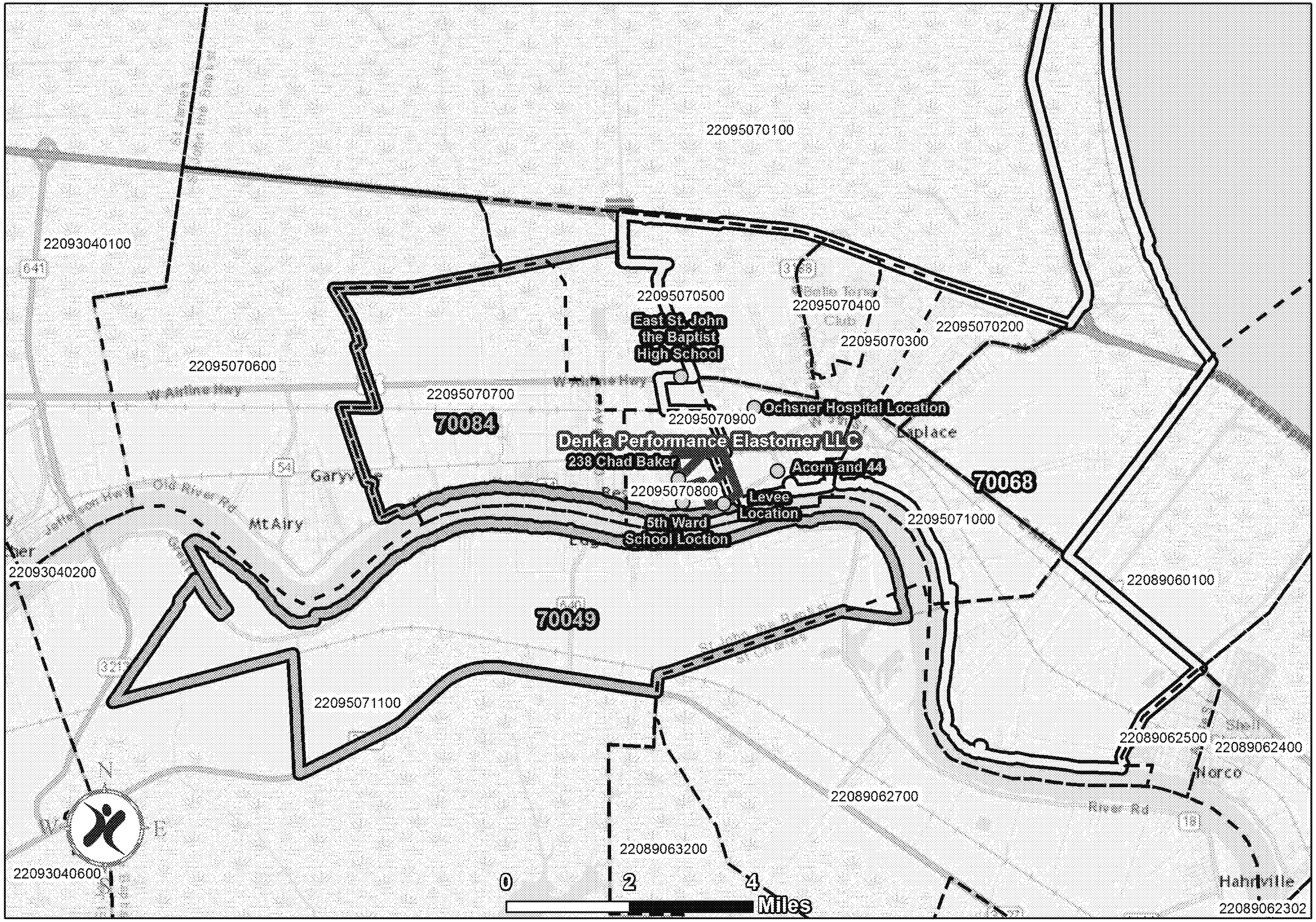
Hi Kathleen,

I was contacted last week by Providence Spina, an attorney with the US EPA, Air Enforcement Division. They are working on an issue around the Denka facility and had some specific questions regarding the health consultation and data that are being evaluated. I suggested they contact you for those issues since the health consult will be a state-released document. I have copied Spina and her colleague, Kathryn, on this email as an introduction. They will reach out to you.

Thanks,
Eva

Eva D. McLanahan, PhD, REHS/RS | CDR, USPHS Commissioned Corps | YJP8@CDC.GOV
Agency for Toxic Substances and Disease Registry | Division of Community Health Investigations
4770 Buford Hwy NE, MS F-59 | Atlanta, GA 30341-3717
Voice: 770-488-0430 | Wed/Thurs/Fri Alt phone: 706-254-6620

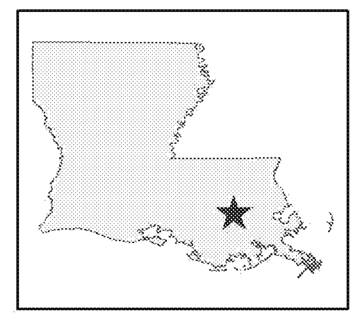
Denka Performance Elastomers LLC in St. John Parish June 22, 2017



ZIP CODE	TOTAL POPULATION	WHITE	BLACK	ASIAN	OTHER	MALE	FEMALE
70084	7552	3374	3997	26	155	3789	3763
70049	2481	111	2344	0	26	1131	1350
70068	34101	16030	16433	307	1331	16604	17497

Air Monitor

Census Tract



Map produced June 22, 2017 by the Louisiana Department of Health / Office of Public Health / Section of Environmental Epidemiology and Toxicology (SEET) using data from the 2010 Census.

* 2010 population density randomly distributed by census block (may not be included on the map)

Note: Zip code 70068 extends to the border of Tangipahaoa Parish on the east side of I-55.

Disclaimer: SEET cannot guarantee the accuracy of the information contained on these maps and expressly disclaims liability for errors and omissions in their contents.

beta-Chloroprene

General Description

Synonyms: 2-Chloro-1,3-butadiene; Chlorobutadiene; Chloroprene
OSHA IMIS Code Number: 0680
IMIS Name History: Chloroprene prior to 5/30/07
Chemical Abstracts Service (CAS) Registry Number: 126-99-8
NIOSH Registry of Toxic Effects of Chemical Substances (RTECS) Identification Number: EI9625000
Department of Transportation Regulation Number (49 CFR 172.101) and Emergency Response Guidebook: 1991 131P (inhibited)
NIOSH Pocket Guide to Chemical Hazards, beta-Chloroprene: chemical description, physical properties, potentially hazardous incompatibilities, and more

Exposure Limits

OSHA Permissible Exposure Limit (PEL):

- **General Industry:** 29 CFR 1910.1000 Z-1 Table -- 25 ppm (90 mg/m^3) TWA; Skin
- **Construction Industry:** 29 CFR 1926.55 Appendix A -- 25 ppm (90 mg/m^3) TWA; Skin
- **Maritime:** 29 CFR 1915.1000 Table Z-Shipyards -- 25 ppm (90 mg/m^3) TWA; Skin

American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) (2017)**:** 1 ppm TWA; Skin; A2
National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limit (REL): 1 ppm (3.6 mg/m^3) Ceiling (15 minutes); Appendix A - NIOSH Potential Occupational Carcinogens

Health Factors

Carcinogenic Classification:

- **Environmental Protection Agency (EPA):** Group D, not classifiable as to human carcinogenicity
- **International Agency for Research on Cancer (IARC):** Group 2B, possibly carcinogenic to humans (Chloroprene)
- **National Toxicology Program (NTP):** Reasonably anticipated to be human carcinogen

NIOSH Immediately Dangerous To Life or Health Concentration (IDLH): 300 ppm
Potential Symptoms: Irritation of eyes, skin, respiratory system; cough, sore throat; headache, dizziness, drowsiness, anxiety, irritability; dermatitis, alopecia; reproductive effects; Skin Absorption: redness, pain; [potential occupational carcinogen]
Health Effects: Reproductive Hazard (HE5); Systemic Toxicity (HE3); Suspected human

carcinogen, mutagen (HE2)

Affected Organs: Eyes, skin, respiratory system, reproductive system

Notes:

1. Chloroprene is an OSHA Select Carcinogen.
2. EPA's inhalation reference concentration (daily inhalational exposure likely to be without an appreciable risk of deleterious effects during a lifetime) for chloroprene is 7 μg/m^3, and EPA's provisional reference dose (RfD) for chloroprene is 0.02 mg/kg/day.
3. Chloroprene is metabolized by cytochrome P-450 2E1 to reactive epoxide intermediates, including enantiomers of (1-chloroethenyl)oxirane, which can form adducts with glutathione, hemoglobin, and DNA. No reports of using any of these adducts as markers for occupational exposure to chloroprene were found.
4. Anemia has been reported to occur in Fischer 344 rats exposed subchronically to 200 ppm chloroprene, as well as in employees occupationally exposed to unreported levels of chloroprene.

Literature Basis:

- NIOSH Pocket Guide to Chemical Hazards: beta-Chloroprene.
- International Chemical Safety Cards (WHO/IPCS/ILO): Chloroprene.
- EPA Air Toxics Website: Chloroprene (2-Chloro-1,3-Butadiene). U.S. Environmental Protection Agency Technology Transfer Network.
- Hurst, H.E. and Ali, M.Y.: Analyses of (1-chloroethenyl)oxirane headspace and hemoglobin N-valine adducts in erythrocytes indicate selective detoxification of (1-chloroethenyl)oxirane enantiomers. Chem. Biol. Interact. **166**(1-3): 332-340, 2007.
- Munter, T., Cottrell, L., Ghai, R., Golding, B.T. and Watson, W.P.: The metabolism and molecular toxicology of chloroprene. Chem. Biol. Interact. **166**(1-3): 323-331, 2007.
- No Author: Chloroprene. Report on Carcinogens (latest edition); U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program.
- Pohanish, R.P. (editor): Chloroprene. In, Sittig's Handbook of Toxic and Hazardous Chemicals and Carcinogens, Fourth Ed., Vol. 1. Norwich, NY: Noyes Publications, William Andrew Publishing, 2002, pp. 591-593.
- Sanotskii, I.V.: Aspects of the toxicology of chloroprene: immediate and long-term effects. Environ. Health Perspect. **17**: 85-93, 1976.
- Valentine, R. and Himmelstein, M.W.: Overview of the acute, subchronic, reproductive, developmental and genetic toxicology of beta-chloroprene. Chem. Biol. Interact. **135-136**: 81-100, 2001.

Date Last Revised: 08/25/2006

Monitoring Methods used by OSHA

Primary Laboratory Sampling/Analytical Method (SLC1):

Sampling Media

Chromosorb 106 (600/300 mg sections, 60/80 mesh)
maximum volume: 6 Liters
maximum flow rate: 0.05 L/min
current analytical method: Gas Chromatography; GC/ECD
analytical solvent: Toluene
method reference: OSHA Analytical Method (OSHA 112)
method classification: Fully Validated

Wipe Sampling Method:

Sampling Media

charcoal pad
note: Seal in glass vial for shipment.

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DEPARTMENT OF LABOR

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CHLOROPRENE PANEL - EXPOSURE, SCREENING AND ASSESSMENT

The community is concerned over the detection of chloroprene in air in St. John Parish. They are asking for information as to the possible health effects from this exposure.

Overarching Questions for Public Health:

- What actions should be taken in response to the detection of chloroprene in air in the LaPlace area?

- What messages should be given to residents, public officials and health care providers regarding the health risks from exposure to chloroprene?

- Some are asking for medical monitoring of nearby residents. Is any type of medical monitoring feasible? If so, what should be recommended? If not, what other actions can be taken?

Other questions:
- Without standards, how should we determine what levels of chloroprene exposure are a concern for human health in LaPlace?
- What would constitute a public health concern?
- What would constitute an emergency health concern?

State & Federal Screening Guidance:
1. Louisiana Ambient Air Standard – 857 ug/m^3 (0.857 mg/m^3)
2. EPA (Region 6) –Guidance for 24 hour long-term (non-cancer) screening value for chloroprene in air is 20 ug/m^3; no standards set yet. (Levels for guidance based on nasal degenerative effects)
3. EPA long-term (cancer) screening value is 0.2 ug/m^3
4. CDC/ATSDR CREG (Cancer Risk Evaluation Guide) screening value is 0.0033 ug/m^3

Topics for discussions based on ATDSR Medical Monitoring Criteria

See LDOH Chloroprene Summary 7-17-17

1. Is there evidence of exposure? (Review draft report summarizing air sampling data.)
   a. Based on current air sampling, can we characterize exposure to the residents?
      - Dose (level of exposure)
      - Duration (historical over time (years)
      - Frequency (how often) - intermittent

Air sampling results: Chloroprene has been detected in air in St. John Parish. Approximately 7.2% or 53 of the 732 samples collected between 5-25/16 and 5/29/17 exceeded the 20 ug/m^3 EPA guidance. The exceedances were intermittent over this time and average 42 ug/m^3.

2. Who is the population at risk (provide maps and zip census numbers?
   a. How far from plant (circumference, directional) would constitute possible exposure?
   b. Defined areas – (Parish, zip codes, census tracks)
   c. How many people within perimeters
   d. Vulnerable populations (e.g., children, elderly)

St. John Parish – East Bank Zip Codes: 70084 and 70068 - West Bank 70049

There are three schools and a residential area within a half mile of the Denka facility. Community questions range from concerns about the safety of children attending these schools to concerns about the impact of chloroprene levels on cancer rates within the residential community.

3. What are the health concerns related to the levels of chloroprene detected in the community?
    a. Non-carcinogenic effects
    b. Carcinogenic effects – literature and IRIS documents
    c. What target organ /effect might be used for in possible screenings
    d. Do we know the latency period? How does this relate to Tumor Registery data?

- Review of Tumor Registry records do not show increase levels of cancer at the St James Parish level.

  Issues with using smaller units (zip codes or census tracks, etc)

4. Is medical monitoring or other testing for chloroprene available?
    a. What types of test are available (blood, urine labs; cancer screening, etc)? How do levels relate to health effects?
    b. Metabolites of chloroprene have been detected in urine of workers.
        i. What are the Issues related to medical monitoring in occupational setting vs general population
    c. What does the detection of metabolites mean in relation to health effects?
    d. Differentiate Biomarkers of exposure and biomarkers of effect
    e. Clarify: Biomarker of exposure is not a clinical endpoint
    f. What other types of monitoring or medical testing are available and feasible for communities?
        i. Are there valid protocols or methods for monitoring exposure in communities using biomonitoring?
    g. Role of medical education as an intervention
        i. Community
        ii. Health care providers

Medical monitoring or workers in industry includes regular medical tests based on exposures over time. No urine or blood test is recommended. Medical monitoring complements primary care.

5. What are the Medical screening requirements – will monitoring identify individuals with unrecognized adverse heath effect.
    a. Are there valid biomarkers indicative of clinical effects?
    b. Screening requirements met or not met

Other ASTDR Medical Monitoring steps if above indicates medical monitoring is feasible:

6. What is the accepted treatment, if any, or intervention for possible effects from chloroprene (differentiate cancer and non-cancer end points)
    a. What types of treatment, if any, might be used if metabolites of chloroprene found in nearby residents?

7. Logistics of system or intervention:
    a. Medical monitoring – if yes, who, how, where
    b. Education and communication – who, how, when, where
        i. What should the local health care providers be aware of related to risks
        ii. What /how should they screen or why not screen
        iii. How to explain risk vs health effects to patients
        iv. Develop a FAQ for physicians

Panel Recommendations :

Review of Chloroprene Data Collected by Ambient Air Monitors in the Community Adjacent to the Denka Co., LTD Facility

LaPlace, St. John Parish, LA

Prepared by:

Section of Environmental Epidemiology and Toxicology

Office of Public Health

DRAFT August 25, 2017

LOUISIANA DEPARTMENT OF HEALTH

Contents

Introduction

The Louisiana Department of Health and Hospitals/Office of Public Health/Section of Environmental Epidemiology and Toxicology (LDH/OPH/SEET) has reviewed ambient air data collected by the US Environmental Protection Agency (EPA) from the community adjacent to the Denka Performance Elastomer, LLC facility in LaPlace, LA. Data from air sampling events performed from May 2016 – July 2017 was reviewed to identify potential cancer risks posed by concentrations of chloroprene present in ambient air in this community.

Background

In 1931, the DuPont chemical company invented Neoprene, a synthetic chemical- and weather-resistant rubber best recognized for its use in wet suits and as a base resin in adhesives and coatings. DuPont's Ponchartrain Works facility, located on the east bank of the Mississippi River in LaPlace, LA, became the leading producer of Neoprene (the trade name for polychloroprene) in North America [1].

On December 10, 2014, DuPont and DENKA Co. Ltd. announced an agreement to sell DuPont's Neoprene facility to Denka Co. Ltd., which is headquartered in Tokyo, Japan. As a result of the acquisition of the Neoprene business, which was completed effective Nov. 1, 2015, a joint venture was formed between Denka Co. Ltd. and Mitsui Co. Ltd., which is also based in Tokyo. Through this joint venture, Denka Performance Elastomer, LLC now serves as owner and operator of the Neoprene facility [1].

On December 17, 2015, the U.S. Environmental Protection Agency (EPA) 2011 National Air Toxics Assessment (NATA) was released. Modeling estimates performed by this screening tool indicated the possibility of elevated cancer risk from chloroprene emissions from Denka/Dupont Neoprene production facility operations in LaPlace [1, 2]. Chloroprene is a component in the manufacture of Neoprene and has been classified by EPA as a "likely to be carcinogenic to humans" since September 2010 [1, 3].

In response to the possibility of elevated risk modeled by NATA, EPA Region 6 and the Louisiana Department of Environmental (LDEQ) conducted preliminary ambient air sampling in March of 2016 to determine if ambient levels of chloroprene could be detected in the community near the facility.

Preliminary Air Sampling Summary

The purpose of preliminary air sampling in the community adjacent to the Denka Neoprene facility was to decide if a more extensive and comprehensive monitoring and assessment plan was needed. In March 2016, two types of samples were collected on six occasions during two different weeks. First, the LDEQ collected instantaneous or "grab" samples and analyzed those samples using a field unit (MAML). Additionally, EPA collected a small number of 8-hour and 24-hour samples. Together, this information allowed the LDEQ and the EPA to identify the sampling techniques to be used to monitor concentrations of chloroprene in the ambient air outside of the facility. The combined preliminary sampling data is summarized in Table 1. Summaries of LDEQ grab sampling and canister sampling are listed in Table 2 [4].

Table 1. Summary of Preliminary Chloroprene Air Monitoring, March 2016

	LDEQ	EPA
Method	"grab" (15 seconds)	canister (2-28 hours)
Dates	3/1/16-3/10/16	3/1/16-3/9/16
# of samples	25	24
# of detects	22	6
% detected	88%	25%
Mean*	17.468 ug/m^3	0.623 ug/m^3
Minimum	ND§	ND
Maximum	66.06 ug/m^3	4.32 ug/m^3

*Zero was used for non-detects in the determination of the mean.
§ND = non-detects

Table 2. Samples Collected During Preliminary Chloroprene Air Monitoring, March 2016

Site Name	Samples Collected	Mean* Concentration (ug/m^3)	Approximate Distance/Direction from Site (mi)	Collection Date(s)
LDEQ Grab Samples				
Recreation Ctr	1	3.47	0.32 SW	3/2/16
214 E. 30th St	1	66.06	0.32 W/SW	3/2/16
Hebert Drive	2	6.165	0.79 N	3/3/16
Ochsner Med Ctr	2	5.475	0.95 N/NE	3/1/16 , 3/2/16
LA 3179	13	19.51	1 NW	3/3/16, 3/8/16, 3/9/16
East St. John HS	1	ND§	1.2 N/NW	3/2/16
US 61 (Airline Hwy)	5	18.048	1.2 N/NW	3/9/16,3/10/16
All sites	25	17.468	-	3/1/16-3/10/16
EPA Canister Samples				
Fifth Ward Elem	4	0.48	0.44 SW	3/1/2016-3/2/2016 3/8/2016-3/9/2016
OLOG School	4	1.08	0.44 SW	3/1/2016-3/2/2016 3/8/2016-3/9/2016
Chad Baker St.	8	0.735	0.44 W	3/1-3/2/2016 3/8/2016-3/9/2016
River Levee (Bkgd)	3	ND	0.6 E	3/2/2016
Hebert Drive	1	ND	0.79 N	3/1/2016
Ochsner Med Ctr	4	0.7075	0.95 N/NE	3/1/2016-3/2/2016 3/9/2016
All sites	24	0.623	-	3/1/2016-3/9/2016

*Zero was used for non-detects in the determination of the mean.
§ND = non-detects

Both EPA's and LDEQ's air monitoring detected chloroprene off-site within and outside of a 1-mile radius of Denka. The concentrations of chloroprene detected indicated the need to collect additional air monitoring data in order to adequately assess potential health risks to the community. EPA stresses that more data will be necessary to determine risk to human health:

> *"The health effects information for chloroprene indicates that long-term exposures may pose a risk of cancer. As a result, the primary potential health concern associated with long-term exposure to chloroprene emissions is related to cancer risk. While the limited data currently available demonstrate the occurrence of detectable concentrations of chloroprene in the ambient air, this preliminary information is not sufficient for EPA to characterize the concentrations and exposures likely to commonly occur in the area over the long term and to make a conclusion regarding any potential long-term health risk. Therefore, the EPA intends to collect additional ambient air and weather data in a longer-term community air monitoring effort. These data are needed to gain an understanding of the potential health risk that might be associated with the long-term presence of chloroprene in the area."* [4]

LDEQ/Denka Response

On January 6, 2017, LDEQ and Denka signed an Administrative Order on Consent (AOC) outlining Denka's voluntary commitment to reduce emissions of chloroprene at the LaPlace facility by the end of 2017. The planned controls are designed to reduce chloroprene emissions by 85 percent from the facility's 2014 baseline chloroprene emissions [2]. Installation of these controls began in February 2017.

Community Concerns

Figure 1 shows the population distribution in St. John Parish. There are three schools and a residential area within a half mile of the Denka facility. Community questions range from concerns about the safety of children attending these schools to concerns about the impact of chloroprene levels on cancer rates within the residential community. The EPA has set up an informational website at [HYPERLINK "https://www.epa.gov/la/laplace-st-john-baptist-parish-louisiana"] to keep the community updated on ambient air sampling results.

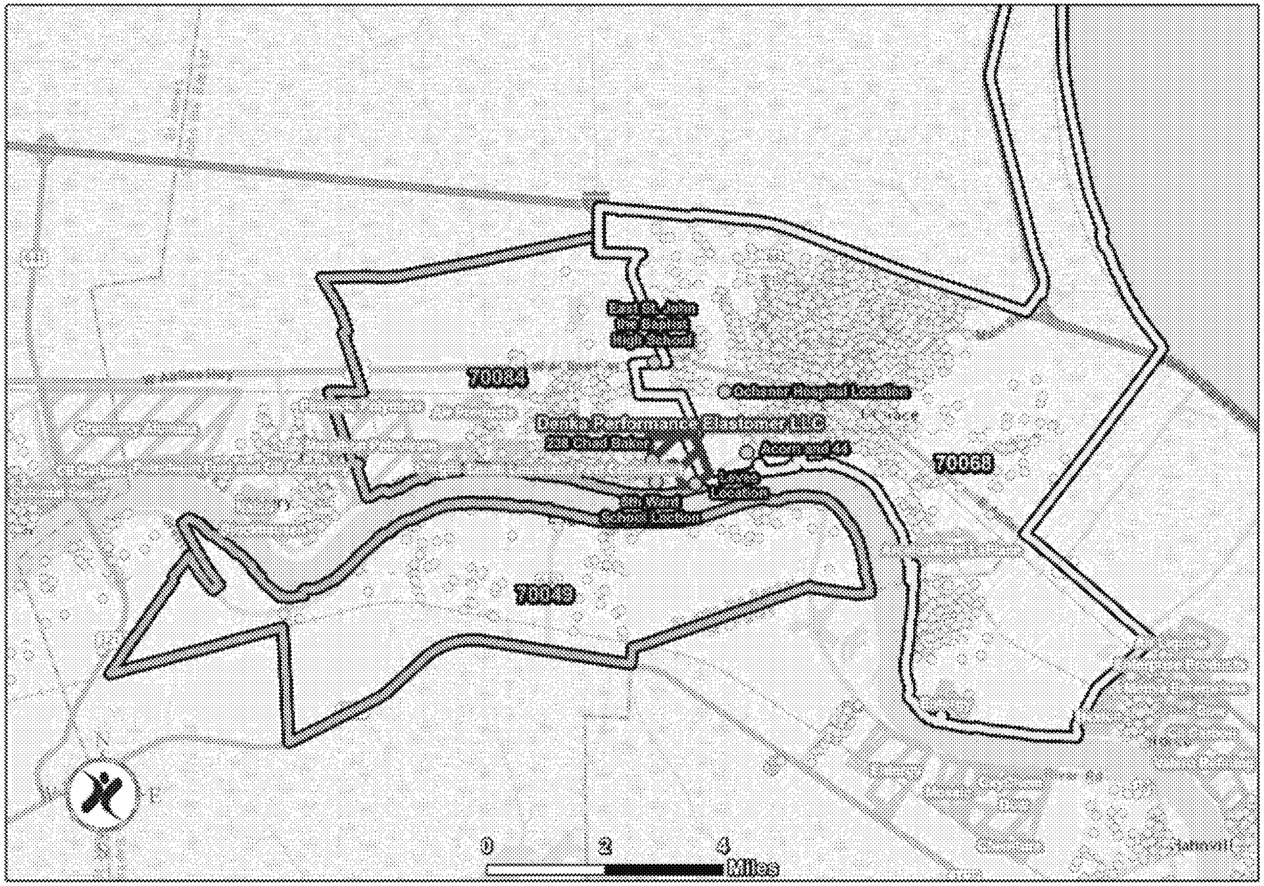


Figure 1.

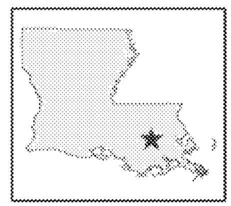
Denka Performance Elastomers LLC in St. John Parish June 22, 2017

ZIP CODE	TOTAL POPULATION	WHITE	BLACK	ASIAN	OTHER	MALE	FEMALE
70084	7552	3374	3997	26	155	3789	3763
70049	2481	111	2344	0	26	1131	1350
70068	34101	16030	16433	307	1331	16604	17497

Air Monitor

Population Density*

1 Dot = 25 People*



Map produced June 22, 2017 by the Louisiana Department of Health / Office of Public Health / Section of Environmental Epidemiology and Toxicology (SEET) using data from the 2010 Census.

* 2010 population density randomly distributed by census block (may not be included on the map)

Note: Zip code 70068 extends to the border of Tangipahoa Parish on the east side of I-55.

Disclaimer: SEET cannot guarantee the accuracy of the information contained on these maps and expressly disclaims liability for errors and omissions in their contents.

Figure 2. Map of Air Monitors in the Community Adjacent to the Denka Facility in LaPlace, LA

Source: https://www.epa.gov/la/laplace-louisiana-air-monitoring-map

Review of EPA Air Monitoring Data Collected May 25, 2016-August 3, 2017

Ambient Air Sampling

EPA's detailed ambient air sampling plan is available at [HYPERLINK "https://www.epa.gov/sites/production/files/2016-07/documents/final_ambient_air_monitoring_plan_for_dpe_laplace_la_may_2016.pdf"] .

Six sites were selected as locations for monitoring levels of chloroprene in the outside air, using monitor siting criteria outlined in the Clean Air Act. These air monitors are located at the following locations (see Figure 2):

- 238 Chad Baker
- Acorn and Highway 44
- East St. John High School
- 5th Ward Elementary School
- Mississippi River Levee
- Ochsner Hospital

A seventh site on the roof of Ochsner Hospital served as a meteorological station, gathering information such as wind speed and direction and barometric pressure. Ambient air sampling follows a 1-in-3 schedule (once every third day) with each sampling event beginning at approximately at 12:00 Local Standard Time (LST) and ending at approximately at 12:00 LST the next day. Samples are collected using SUMMA canisters calibrated for 24-hour sampling [5].

Summary of EPA Ambient Air Monitoring Data

Results of ambient air sampling from May 2016 to August 2017 are listed in the Appendix in Table A-1. A total of 780 samples, excluding those with invalid results or no results reported, were collected during this period.

EPA has established a non-cancer comparison value for long-term exposure of 20 ug/m^3. A continuous inhalation exposure to chloroprene at this concentration for humans, including sensitive individuals, is likely to be without a significant risk of harmful effects during a lifetime. There are 58 instances where this level was exceeded during the May 2016 to August 2017 sampling event (see highlighted cells in Table A-1).

Estimation of Theoretical Lifetime Excess Cancer Risk

Theoretical lifetime excess cancer risks for the exposure to chloroprene levels detected in the community surrounding the Denka facility were calculated using averages for ambient air data collected in the community surrounding the facility in 2016 and in 2017. The lifetime excess cancer risk represents the increase in the probability of an individual developing cancer as a result of being exposed to a contaminant over a lifetime of 70 years. To calculate these conservative estimates, the average chloroprene concentration captured at each of the six air monitoring stations was multiplied by the mutagenic inhalation unit risk (IUR) for chloroprene (5.00×10^{-4} per ug/m^3), which is the composite IUR adjusted for continuous exposure from birth. A concentration of half the detection limit (0.018 ug/m^3, half of the detection limit of 0.036 ug/m^3) was substituted for concentrations recorded as nondetects (ND) or annotated as “below the detection limit”.

Because of the uncertainty involved in estimating carcinogenic risk, a weight-of-evidence approach is used to describe this risk, using words as well as numeric terms. The lifetime excess cancer risk estimates the worst-case maximum increase in the risk of developing cancer after exposure to the chemical in question. This estimation is accurate within one order of magnitude. Therefore, a calculated cancer risk of 3 excess cancers per 10,000 people might actually be 3 excess cancers per 1,000 people or

2 excess cancers per 100,000 people. The risk above which cancer may potentially be due to an external cause rather than to population variation is 1×10^{-4} or 1 excess cancer per 10,000 people.

Table 3. Estimation of lifetime excess cancer risk for chloroprene concentrations (in ug/m^3) in EPA ambient air canister samples (24-hr) collected from LaPlace, LA, May 2016 – August 2017

	2016				2017			
Air Monitor Location	**2016 average chloroprene concentration (ug/m^3)**	**2016 Samples per Location**	**2016 % Detects per Location**	**2016 Estimated Lifetime Excess Cancer Risk**	**2017 average chloroprene concentration (ug/m^3)**	**2017 Samples per Location**	**2017 % Detects per Location**	**2017 Estimated Lifetime Excess Cancer Risk**
238 Chad Baker	10.310	69	82.61	5.16×10^{-3}	5.256	72	69.44	2.63×10^{-3}
Acorn & Hwy 44	7.534	70	64.29	3.77×10^{-3}	1.796	72	62.50	8.98×10^{-4}
ESJH	2.214	70	78.57	1.11×10^{-3}	1.348	71	70.42	6.74×10^{-4}
5th Ward Elem	8.699	69	81.16	4.35×10^{-3}	4.140	72	63.89	2.07×10^{-3}
Levee	10.128	69	86.96	5.06×10^{-3}	3.251	70	71.43	1.63×10^{-3}
Ochsner	5.214	70	67.14	2.61×10^{-3}	2.241	72	72.22	1.12×10^{-3}

Table 3 summarized estimated lifetime excess cancer risks for ambient air samples collected in 2016 and 2017. The estimated lifetime excess cancer risks for exposure to the average chloroprene concentrations present in ambient air adjacent to the Denka facility in 2016 ranged from 1.11×10^{-3} to 5.16×10^{-3} (from approximately 1 excess cancer per 1,000 people to 5 excess cancers per 1,000 people). The estimated lifetime excess cancer risks for exposure to the average chloroprene concentrations present in ambient air adjacent to the Denka facility in 2017, as measures began to be implemented by the company to reduce emissions, ranged from 6.74×10^{-4} to 2.63×10^{-3} (from approximately 7 excess cancers per 10,000 people to approximately 3 excess cancers per 1,000 people).

These estimated lifetime excess cancer risks are above the risk likely to be due to population variation (1×10^{-4}). However, a decrease in the estimated lifetime excess cancer risk appears to be related to the installation of emission reduction controls at the Denka facility at the beginning of 2017.

Toxicological Review of Chloroprene

When inhaled, chloroprene enters the body through the respiratory system, absorbed into the bloodstream, and distributed throughout the body. Chloroprene is rapidly metabolized which makes it difficult to measure in the body. During metabolism, chloroprene may generate reactive intermediates that are a mechanism of its toxicity and are a factor in its being considered a potential carcinogen. There is a limited body of information on the noncancer health effects to humans who are exposed to chloroprene. Occupational exposures to chloroprene at high levels ranging from 1–7 mg/m3 (or 1,000-7,000 ug/m^3) 3.6–25 ppm (or 3,600-25,000 ppb) have been reported to cause respiratory, eye, and skin irritation, chest pains, temporary hair loss, dizziness, insomnia, headache, and fatigue in occupationally exposed workers. Other effects reported include changes in the nervous system (lengthening of sensorimotor response to visual cues and increased olfactory thresholds), cardiovascular system (muffled heart sounds, reduced arterial pressure, and tachycardia), and changes in blood such as reduced red blood cell counts and decreased hemoglobin. The concentrations of chloroprene currently being detected in community near the Denka facility are orders of magnitude below the levels reported to be related to these health effects [3].

The classification of chloroprene as "likely to be carcinogenic to humans" is partially based on evidence of an association between liver cancer risk and occupational exposure to chloroprene and suggestive evidence of an association between lung cancer risk and occupational exposure. Studies in the literature, however, provide conflicting conclusions [3].

Discussion

Based on conservative estimates, continuous exposure to the average concentrations of chloroprene in ambient air samples collected from the community adjacent to the Denka facility from May 2016 to August 2017 may pose an increase in the probability of an individual developing cancer over a lifetime of 70 years. These estimates do not directly predict the occurrence of cancer in the community but pose a worse-case maximum estimate of potential risk. Additionally, an individual's probability of developing cancer would additionally be influenced by genetic background, lifestyle, and exposure to a variety of environmental factors unrelated to chloroprene exposure.

The most effective way to protect public health from the risks associated with chloroprene exposure is to control chloroprene emissions. Denka is implementing control measures to reduce chloroprene emissions at the LaPlace facility. Continued air sampling by EPA will monitor the impact of these emission controls on the concentrations of chloroprene in ambient air in the adjacent community.

Conclusions

This report summarizes the air monitoring data for chloroprene in St. John Parish as provided through the EPA website at [HYPERLINK "https://www.epa.gov/la/laplace-louisiana-air-monitoring-data"] .

SEET is committed to addressing community concerns about the risks involved in exposure to airborne contaminants and to providing the public with the best science-based information available to keep the community safe. SEET will continue to review chloroprene data as it becomes available and as Denka continues to implement emissions reduction measures at the LaPlace facility.

References

1. United States Environmental Protection Agency. LaPlace, Louisiana – Background Information. EPA in Louisiana website. [HYPERLINK "https://www.epa.gov/la/laplace-louisiana-background-information"] . Accessed July 18, 2017.

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APPENDIX

Table A-1. Chloroprene concentrations (in ug/m^3) in EPA ambient air canister samples (24-hr) collected from LaPlace, LA, May 2016 – August 2017

Sample Date	Sample Locations					
	238 Chad Baker	Acorn & Hwy 44	ESJH	5th Ward Elem	Levee	Ochsner
5/25/2016	*ND*[*]	1.291	0.831	*ND*	*ND*	*ND*
5/28/2016	--[§]	--	*Invalid*[†]	*Invalid*	--	*Invalid*
5/31/2016	7.581	30.322	2.017	3.072	6.130	17.482
6/2/2016	7.145	0.073	2.666	1.882	2.637	0.065
6/5/2016	11.099	*ND*	0.341	4.969	20.493	0.809
6/9/2016	5.477	0.624	1.251	3.409	4.824	4.679
6/12/2016	5.368	0.983	5.441	0.573	0.272	1.277
6/15/2016	1.211	0.225	1.031	1.745	0.366	10.809
6/18/2016	7.871	4.298	0.268	1.890	2.702	2.981
6/21/2016	5.078	*ND*	1.037	1.298	0.413	0.686
6/24/2016	0.305	6.819	0.029 U[‡]	*ND*	0.319	7.544
6/27/2016	0.163	1.193	0.417	*ND*	0.04	1.614
6/30/2016	4.534	*ND*	0.352	3.5	7.145	*ND*
7/3/2016	*ND*	0.054	1.694	*ND*	*ND*	4.28
7/6/2016	*ND*	*ND*	0.12	*ND*	*ND*	9.612
7/9/2016	1.708	4.751	0.762	0.345	1.882	6.021
7/12/2016	6.89	1.23	2.36	5.62	0.722	0.232
7/15/2016	12.441	0.881	0.914	3.627	6.456	1.534
7/18/2016	36.996	*ND*	0.276	44.25	1.705	*ND*
7/21/2016	5.005	1.182	2.122	11.28	4.897	1.059
7/24/2016	16.721	9.068	8.161	8.088	9.467	10.011
7/27/2016	*ND*	1.708	0.196	*ND*	*ND*	3.587
7/30/2016	2.488	5.295	2.67	3.148	6.347	11.208
8/2/2016	0.254	0.881	1.864	10.337	16.757	6.565
8/5/2016	5.840	12.477	2.387	8.669	21.400	5.477
8/8/2016	0.417	4.86	1.629	0.569	2.771	0.827
8/11/2016	*ND*	12.803	*ND*	*ND*	0.649	2.426
8/14/2016	*Invalid*	*Invalid*	*Invalid*	*Invalid*	*Invalid*	*Invalid*
8/23/2016	5.19	34.7	8.56	--	--	24
8/26/2016	1.610	0.468	0.301	6.060	2.230	1.37
8/29/2016	25.600	*ND*	0.627	38.400	0.073	*ND*
9/1/2016	0.798	*ND*	*ND*	13.100	8.090	*ND*
9/4/2016	31.000	39.2	10.2	34.700	74.700	7.65
9/7/2016	*Invalid*	2.21	2.17	3.440	2.140	1.17
9/10/2016	10.900	0.16	4.9	6.270	2.530	0.791
9/13/2016	46.100	*ND*	0.12	16.100	0.232	*ND*

Sample Date	Sample Locations					
	238 Chad Baker	Acorn & Hwy 44	ESJH	5th Ward Elem	Levee	Ochsner
9/16/2016	28.600	*ND*	0.921	0.693	*ND*	*ND*
9/19/2016	*ND*	0.105	0.033	*ND*	1.320	0.076
9/22/2016	0.363	*ND*	0.065	0.722	0.180	*ND*
9/25/2016	0.109	0.073	0.127	0.105	0.548	*ND*
9/28/20016	0.073	0.432	0.051	0.555	3.370	0.301
10/1/2016	0.051	*ND*	*ND*	*ND*	10.300	*ND*
10/4/2016	37.400	1.27	24.900	42.400	26.800	6.06
10/7/2016	32.800	0.403	1.37	5.770	4.240	0.704
10/10/2016	8.490	*ND*	*ND*	12.500	8.740	*ND*
10/13/2016	18.800	*ND*	3.570	1.760	1.270	0.258
10/16/2016	32.300	*ND*	*ND*	25.600	3.330	*ND*
10/19/2016	12.100	*ND*	1.700	0.232	*ND*	*ND*
10/22/2016	0.410	*ND*	*ND*	*ND*	13.500	0.073
10/25/2016	29.800	57.300	12.000	33.000	67.500	43.500
10/28/2016	25.000	*ND*	0.070	11.100	11.900	*ND*
10/31/2016	5.040	17.500	16.200	1.960	29.600	27.500
11/3/2016	18.800	*ND*	*ND*	66.400	2.300	*ND*
11/6/2016	32.600	0.540	0.102	28.900	3.120	0.120
11/9/2016	0.921	*ND*	*ND*	16.400	*ND*	*ND*
11/12/2016	0.221	*ND*	15.100	2.220	*ND*	*ND*
11/15/2016	*ND*	106.000	0.268	*ND*	54.800	59.800
11/18/2016	16.9	0.827	3.61	23.4	0.21	0.831
11/21/2016	8.27	153	0.388	1.6	147	66.7
11/24/2016	2.81	5.66	0.87	1.02	17.1	3.77
11/27/2016	3.74	0.025	ND	5.4	4.9	0.018
11/30/2016	0.018	0.025	0.058	0.025	0.802	0.218
12/3/2016	40.6	0.044	ND	0.979	ND	ND
12/6/2016	2.42	3.41	0.413	0.635	0.029	0.787
12/9/2016	ND	ND	ND	0.433	0.537	ND
12/12/2016	ND	0.196	2.41	ND	0.381	2.44
12/15/2016	ND	ND	ND	0.025	21.3	ND
12/18/2016	ND	ND	ND	ND	8.81	2.22
12/21/2016	40.3	1.71	0.889	37.4	17.4	3.21
12/24/2016	26.2	ND	0.82	20.9	10.6	ND
12/27/2016	17.1	0.649	1.11	16.7	0.812	0.232
12/30/2016	3.18	ND	ND	4.82	17.6	ND
1/2/2017	19.5	3.06	2.93	0.664	ND	2.76
1/5/2017	33.2	ND	0.577	17.5	4.68	ND

Sample Date	Sample Locations					
	238 Chad Baker	Acorn & Hwy 44	ESJH	5th Ward Elem	Levee	Ochsner
1/8/2017	1.28	ND	ND	1.81	Invalid	ND
1/11/2017	ND	ND	20.3	0.033	0.029	0.083
1/14/2017	20	ND	ND	75.1	0.381	ND
1/17/2017	ND	0.036	11	ND	0.036	0.522
1/20/2017	ND	7.76	0.145	ND	ND	1.78
1/23/2017	ND	6.09	ND	ND	ND	0.022
1/26/2017	ND	ND	ND	ND	0.939	0.297
1/29/2017	ND	0.352	ND	ND	ND	ND
2/1/2017	ND	ND	0.051	ND	ND	0.051
2/4/2017	0.058	ND	ND	0.141	0.203	ND
2/7/2017	ND	ND	0.087	ND	ND	0.051
2/10/2017	1.32	ND	0.022	1.15	9.68	ND
2/13/2017	0.316	14.2	ND	8.56	0.656	0.04
2/16/2017	0.073	2.69	ND	0.218	2.62	ND
2/19/2017	0.551	0.301	0.682	1.74	0.334	0.112
2/22/2017	0.109	1.96	0.047	0.091	3.06	0.16
2/25/2017	ND	0.939	ND	ND	35.8	11.1
2/28/2017	ND	0.265	7.76	ND	ND	1.27
3/3/2017	2.58	ND	ND	1.36	2.25	ND
3/6/2017	ND	ND	0.62	ND	ND	ND
3/9/2017	14.8	ND	1.44	3.15	0.112	0.047
3/12/2017	5.6	ND	0.076	11.9	0.279	ND
3/15/2017	0.497	0.04	0.025	2.44	2.25	0.025
3/18/2017	0.152	0.25	2.21	0.022	0.022	0.562
3/21/2017	ND	2.84	ND	0.025	0.022	13.3
3/24/2017	0.062	0.029	0.178	ND	0.025	0.025
3/27/2017	ND	0.022	4.86	ND	0.022	0.033
3/30/2017	2.67	0.881	2.66	0.283	0.406	2.67
4/2/2017	4.9	ND	ND	0.044	ND	ND
4/5/2017	0.334	0.729	0.21	ND	ND	3.74
4/8/2017	17.3	0.925	3.2	13.7	28.3	1.05
4/11/2017	8.96	0.029	0.294	3.84		0.036
4/14/2017	24.6	ND	1.35	51.1	12.5	0.218
4/17/2017	18.4	0.029	1.53	17.6	0.12	0.276
4/20/2017	8.27	ND	0.381	7.62	0.319	0.109
4/23/2017	0.765	0.816	0.102	0.051	10.6	0.232
4/26/2017	0.025	0.029	Invalid	0.054	0.029	2.39
4/29/2017	0.044	0.029	2.19	0.033	0.033	0.029

Sample Date	**Sample Locations**					
	238 Chad Baker	Acorn & Hwy 44	ESJH	5th Ward Elem	Levee	Ochsner
5/2/2017	9.94	11.5	6.6	4.64	9.9	17.6
5/5/2017	ND	2.81	ND	ND	0.174	0.312
5/8/2017	0.508	11	0.297	0.323	9.68	14.9
5/11/2017	0.729	0.254	2.25	ND	0.022	0.247
5/14/2017	ND	ND	ND	ND	1.22	ND
5/17/2017	ND	ND	0.109	ND	ND	ND
5/20/2017	ND	ND	0.025	ND	ND	0.018
5/23/2017	0.098	0.062	ND	ND	ND	0.062
5/26/2017	ND	ND	0.054	ND	ND	0.163
5/29/2017	0.395	0.134	0.323	0.323	1.48	0.725
6/1/2017	7.73	0.214	0.109	2.06	0.366	0.102
6/4/2017	2.57	0.943	2.56	0.116	0.479	0.751
6/7/2017	0.872	ND	ND	1.18	5.59	ND
6/10/2017	19.7	ND	0.91	6.27	ND	ND
6/13/2017	28.6	ND	1.59	0.823	ND	0.758
6/16/2017	ND	4.82	ND	ND	ND	35.9
6/19/2017	26.7	2.59	1.6	10.7	7.76	2.47
6/22/2017	0.16	ND	4.43	ND	ND	ND
6/25/2017	11.8	7.15	0.61	11.8	13.9	0.384
6/28/2017	45.7	ND	2.14	6.6	0.199	ND
7/1/2017	ND	0.167	ND	ND	ND	4.5
7/4/2017	0.058	0.28	ND	ND	ND	6.06
7/7/2017	1.42	6.49	0.308	1.65	2.68	0.94
7/10/2017	0.152	8.31	0.083	4.21	34.2	0.334
7/13/2017	4.63	2.4	0.878	3.7	2.81	1.17
7/16/2017	4.64	5.04	2.73	2.09	5.88	11.2
7/19/2017	1.58	3.55	0.878	3.35	3.81	5.51
7/22/2017	5.11	13.9	1.06	10.2	7	2.02
7/25/2017	ND	0.929	0.345	ND	0.744	2.73
7/28/2017	ND	1.97	ND	ND	0.087	9.14
7/31/2017	4.28	ND	ND	1.76	2.63	ND
8/3/2017	14.3	ND	0.493	5.55	0.892	ND

Ref. through 6/2017 [HYPERLINK "https://www.epa.gov/la/denka-air-monitoring-summary-sheet-2"]

*ND = Concentration not detetcted

§-- = No sample received in lab

†Invalid = Sample was invalid

‡U = Concentration below method detection limit

NOTE: No samples collected on August 16-20, 2016 due to flooding in Louisiana

Louisiana Department of Health
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Message

From:	Shermer, Steven (ENRD) [Steven.Shermer@usdoj.gov]
Sent:	8/2/2019 7:06:37 PM
To:	Jarrell, Eric [ejarrell@kingjurgens.com]
CC:	Lannen, Justin [Lannen.Justin@epa.gov]; robyn.hanson@usdoj.gov [Robyn.Hanson@usdoj.gov]; Ted Broyles [Ted.Broyles@LA.GOV]; ajames@kingjurgens.com
Subject:	Denka/DuPont - Pontchartrain Works Site - Confidential Settlement Communication Subject to FRE 408
Attachments:	ENV_ENFORCEMENT-#2822591-v1-Denka_-_Final_August_2019_Stlmt_Ltr_to_DuPont.PDF

Eric – attached please find a response to DuPont's November 1, 2018 confidential settlement response in this matter. After you've had a chance to review this letter, please let us know when you expect to be able to respond.

Please let me or Robyn know if you have any questions or concerns.

Thanks,

Steve

Steven D. Shermer
Senior Attorney
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Message

From: Ted Broyles [Ted.Broyles@LA.GOV]
Sent: 7/1/2019 8:20:19 PM
To: steven.shermer@usdoj.gov; robyn.hanson@usdoj.gov [Robyn.Hanson@usdoj.gov]; Lannen, Justin [Lannen.Justin@epa.gov]
Subject: Denka
Attachments: Draft - Denka and DuPont_-_Complaint with La. edits.docx

Here are my edits/comments on the draft. Thanks for the extended time to review and especially for your exceptional work.

TED R. BROYLES, II
Attorney IV
Enforcement and Remediation

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
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Message

From: Shermer, Steven (ENRD) [Steven.Shermer@usdoj.gov]
Sent: 7/26/2019 7:20:31 PM
To: Ted Broyles [Ted.Broyles@LA.GOV]
CC: Lannen, Justin [Lannen.Justin@epa.gov]; robyn.hanson@usdoj.gov [Robyn.Hanson@usdoj.gov]
Subject: Denka/DuPont - Work Product/Attorney Client Privileged - draft letter to DuPont
Attachments: ENV_ENFORCEMENT-#2819134-v1-Denka_-_draft_July_2019_settlemen_ltr_to_DuPont.DOC

Hey Ted – good news/bad news for you. The bad news is I'm attaching a rather lengthy letter for your review. The good news is that it's a response to DuPont's last settlement offer, so we can get the ball rolling again on our settlement discussions.

Take a look, and let me know if you or anyone on your team have any comments or concerns. If not, we'll get this out the door to DuPont. Denka's letter should be coming to you next week. It's a little longer (sorry) and more complicated since it contains more detailed injunctive relief demands.

Thanks,

Steve

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Message

From: Ted Broyles [Ted.Broyles@LA.GOV]
Sent: 1/31/2020 1:41:10 PM
To: steven.shermer@usdoj.gov; Lannen, Justin [Lannen.Justin@epa.gov]
Subject: FW: PBPK model has been published!
Attachments: ATT00001.txt; Clewell et al 2020 chloroprene online.pdf

If you should need some light reading during the Superbowl.

From: Walsh, Patrick <patrick-walsh@denka-pe.com>
Sent: Wednesday, January 29, 2020 9:56 AM
To: Chuck Brown <Chuck.Brown@LA.GOV>; Lourdes Iturralde <Lourdes.Iturralde@LA.GOV>
Subject: PBPK model has been published!

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Dr. Brown, Lourdes,

As requested, here is the journal article and link for the published PBPK model manuscript. The link is Open Access, so anyone can view it. Let me know if you have any other questions.

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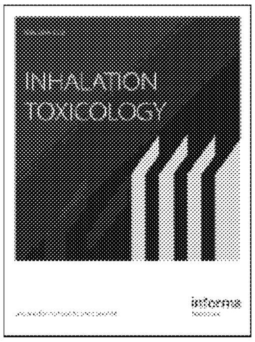
Incorporation of in vitro metabolism data and physiologically based pharmacokinetic modeling in a risk assessment for chloroprene

Taylor & Francis



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Incorporation of *in vitro* metabolism data and physiologically based pharmacokinetic modeling in a risk assessment for chloroprene

Harvey J. Clewell III, Jerry L. Campbell, Cynthia Van Landingham, Allison Franzen, Miyoung Yoon, Darol E. Dodd, Melvin E. Andersen & P. Robinan Gentry

To cite this article: Harvey J. Clewell III, Jerry L. Campbell, Cynthia Van Landingham, Allison Franzen, Miyoung Yoon, Darol E. Dodd, Melvin E. Andersen & P. Robinan Gentry (2020): Incorporation of *in vitro* metabolism data and physiologically based pharmacokinetic modeling in a risk assessment for chloroprene, Inhalation Toxicology, DOI: 10.1080/08958378.2020.1715513

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INHALATION TOXICOLOGY
https://doi.org/10.1080/08958378.2020.1715513

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RESEARCH ARTICLE

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Incorporation of *in vitro* metabolism data and physiologically based pharmacokinetic modeling in a risk assessment for chloroprene

Harvey J. Clewell III[a], Jerry L. Campbell[a], Cynthia Van Landingham[b], Allison Franzen[b], Miyoung Yoon[c], Darol E. Dodd[d], Melvin E. Andersen[d] and P. Robinan Gentry[b]

[a]Ramboll US Corporation, Research Triangle Park, NC, USA; [b]Ramboll US Corporation, Monroe, LA, USA; [c]ToxStrategies, Inc, Cary, NC, USA; [d]The Hamner Institutes for Health Sciences, Research Triangle Park, NC, USA

ABSTRACT

Objective: To develop a physiologically based pharmacokinetic (PBPK) model for chloroprene in the mouse, rat and human, relying only on *in vitro* data to estimate tissue metabolism rates and partitioning, and to apply the model to calculate an inhalation unit risk (IUR) for chloroprene.

Materials and methods: Female B6C3F1 mice were the most sensitive species/gender for lung tumors in the 2-year bioassay conducted with chloroprene. The PBPK model included tissue metabolism rate constants for chloroprene estimated from results of *in vitro* gas uptake studies using liver and lung microsomes. To assess the validity of the PBPK model, a 6-hr, nose-only chloroprene inhalation study was conducted with female B6C3F1 mice in which both chloroprene blood concentrations and ventilation rates were measured. The PBPK model was then used to predict dose measures – amounts of chloroprene metabolized in lungs per unit time – in mice and humans.

Results: The mouse PBPK model accurately predicted *in vivo* pharmacokinetic data from the 6-hr, nose-only chloroprene inhalation study. The PBPK model was used to conduct a cancer risk assessment based on metabolism of chloroprene to reactive epoxides in the lung, the target tissue in mice. The IUR was over100-fold lower than the IUR from the EPA Integrated Risk Information System (IRIS), which was based on inhaled chloroprene concentration. The different result from the PBPK model risk assessment arises from use of the more relevant tissue dose metric, amount metabolized, rather than inhaled concentration

Discussion and conclusions: The revised chloroprene PBPK model is based on the best available science, including new test animal *in vivo* validation, updated literature review and a Markov-Chain Monte Carlo analysis to assess parameter uncertainty. Relying on both mouse and human metabolism data also provides an important advancement in the use of quantitative *in vitro* to *in vivo* extrapolation (QIVIVE). Inclusion of the best available science is especially important when deriving a toxicity value based on species extrapolation for the potential carcinogenicity of a reactive metabolite.

ARTICLE HISTORY
Received 11 June 2019
Accepted 9 January 2020

KEYWORDS
Chloroprene; inhalation; PBPK; cancer risk assessment

Introduction

Chloroprene (CAS # 126-99-8) is a highly volatile chlorinated analog of 1,3-butadiene that is used in the manufacture of polychloroprene rubber (Neoprene). A cancer risk assessment for chloroprene conducted by the USEPA (2010) calculated an inhalation unit risk (IUR) of 5×10^{-4} per µg/m^3 based on tumor incidence data from female mice exposed to chloroprene for 2 years (NTP 1998; Melnick et al. 1999). The USEPA (2010) assessment used a default cross-species extrapolation approach based on chloroprene exposure concentration, despite strong evidence of quantitative differences in chloroprene metabolism in mice and humans that would have a significant impact on the calculated risk (Himmelstein, Carpenter, and Hinderliter 2004; Himmelstein, Carpenter, Evans, et al. 2004). The metabolism of chloroprene results in the formation of reactive epoxides that are considered to be responsible for its carcinogenicity in rodents (USEPA 2010).

To determine the potential impact of species-specific differences in the production of these epoxides, a physiologically based pharmacokinetic (PBPK) model was developed in a collaborative research effort between DuPont Haskell Laboratory and the USEPA National Health and Environmental Effects Research Laboratory (NHEERL). *In vitro* measurements of partition coefficients and metabolism parameters for chloroprene in mice, rats, hamsters and humans (Himmelstein, Carpenter, and Hinderliter 2004) were used in the PBPK model (Himmelstein, Carpenter, Evans, et al. 2004) to predict species-specific dose metrics for the production of epoxides in the lung, the most

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Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/iiht.
Supplemental data for this article can be accessed at https://doi.org/10.1080/08958378.2020.1715513

sensitive tissue in the mouse bioassay. The dose metric chosen for this comparison is consistent with the dose metrics used in previous PBPK-based risk assessments for methylene chloride and vinyl chloride, which are also metabolized to reactive metabolites that are considered to be responsible for the observed carcinogenicity in rodents. Closed-chamber exposures of mice, rats and hamsters were used to validate the PBPK model's ability to predict the pharmacokinetic behavior of chloroprene *in vivo*. The USEPA (2010), however, did not make use of the PBPK model from Himmelstein, Carpenter, Evans, et al. (2004) in their risk assessment, citing the lack of blood or tissue time course concentration data for model validation. In addition, USEPA indicated that they did not consider the comparisons of model predictions with the closed-chamber studies to be adequate because the data were limited to chloroprene vapor uptake from the closed chambers.

After the time of the USEPA (2010) evaluation, Yang et al. (2012) provided additional data for refining the PBPK model of Himmelstein, Carpenter, Evans, et al. (2004). To supplement the data in Himmelstein, Carpenter, and Hinderliter (2004) on liver and lung metabolism in male mouse, male rat, and pooled human cells, subsequent studies (IISRP 2009a) measured liver and lung metabolism in female mouse and female rat, as well as kidney metabolism in male and female mouse, male and female rat, and pooled human cells. The totality of the data from the Himmelstein, Carpenter, and Hinderliter (2004), and IISRP (2009a) *in vitro* metabolism studies were then used to refine the metabolism parameter estimates for the chloroprene PBPK model using Markov-chain Monte Carlo (MCMC) analysis. A comparison of lung dose metric estimates in mouse, rat and human was then performed using the updated metabolism parameters (Yang et al. 2012). These dose metrics were subsequently used in a study comparing genomic responses to chloroprene in the mouse and rat lung (Thomas et al. 2013) and a study comparing human risk estimates derived from mouse bioassay and human epidemiological data (Allen et al. 2014), but to date no *in vivo* blood or tissue time course concentration data have been published with which to evaluate the ability of the chloroprene PBPK model to predict *in vivo* kinetics.

The objectives of the present study were to (1) characterize the *in vivo* pharmacokinetics of chloroprene via analysis of whole blood concentrations in female B6C3F1 mice during and following a single 6-hr nose-only inhalation exposure, and (2) determine respiratory parameters (breathing frequency and tidal volume) during chloroprene exposure. In this paper we also demonstrate the ability of the refined chloroprene PBPK model to reproduce new *in vivo* validation data and use the PBPK model in an inhalation cancer risk assessment that properly considers species differences in pharmacokinetics and metabolism.

Materials and methods

Nose-only exposure study

Test substance and atmosphere generation

The test substance, β-Chloroprene (CAS # 126-99-8) containing polymerization inhibitors, was supplied by the sponsor as a clear liquid. Exposure atmospheres were generated by metering saturated chloroprene vapor from a stainless-steel pressure vessel reservoir (McMaster Carr, Atlanta, GA) into the nose-only exposure chamber air supply. The concentrated chloroprene vapor was metered through a mass flow controller (MKS Instruments Inc., Andover, MA) and mixed with HEPA-filtered air approximately six feet upstream of the nose-only inlet. Chloroprene vapor was introduced counter-current to the dilution air to facilitate mixing of the vapors with the dilution air. Chloroprene concentrations were monitored on-line using a gas chromatography system with flame ionization detector (GC-FID). Calibration of the GC-FID for chloroprene analysis was conducted through the analysis of a series of calibration standards produced by introducing pure chloroprene into Tedlar® bags containing known volumes of nitrogen gas (nitrogen was metered into the bag using a calibrated flow meter).

Test animals and housing

Female B6C3F1 were purchased from Charles Rivers Laboratories, Inc (Raleigh, NC) at 8 weeks of age and acclimated to their surroundings for approximately two weeks prior to use. Following acclimation animals were assigned to a dosing group by randomization of body weights using Provantis NT 2000, assigned unique identification numbers, cage cards, and housed (1/cage) in polycarbonate cages with standard cellulose bedding. Animals were housed in a humidity and temperature controlled, HEPA-filtered, mass air-displacement room provided by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC) accredited animal facility at The Hamner Institutes. This room was maintained on a 12-hr light-dark cycle at approximately 64oC-79oF with a relative humidity of approximately 30–70%. Rodent diet NIH-07 (Zeigler Brothers, Gardners, PA) and reverse osmosis water was provided ad libitum except during exposures. Food and water were withheld from all animals during the chloroprene exposures. Prior to the start of the chloroprene exposure, animals were weighed and their weights were recorded.

The Hamner Institutes for Health Sciences was fully accredited by the AAALAC during the time the study was performed. Currently acceptable practices of good animal husbandry were followed per the National Research Council Guide for the Care and Use of Laboratory Animals and were in compliance with all appropriate parts of the Animal Welfare Act. In addition, the study design and protocol were approved by The Hamner Institutes' Institutional Animal Care and Use Committee (IACUC) prior to the initiation of the study.

Inhalation exposures

Inhalation exposures were conducted at 13, 32, and 90 ppm for 6 hr. Blood was collected by cardiac puncture at a total of 6 time-points, 0.5, 3, and 6 hr during exposure and 5, 10, and 15 min post-exposure. To support collection of whole blood during the exposures, nose only towers were fitted with specially designed nose only exposure tubes. These exposure tubes were manufactured from 50 mL polypropylene bulb irrigation syringes (Sherwood Medical, St. Louis, MO). Three elongated holes (0.625″ × 1.125″) were drilled into the wall of the syringe to allow access to the thorax of the mouse during chloroprene exposure. A second irrigation syringe was cut to form a sleeve around the first syringe to provide an air tight barrier during the exposures. This sleeve was pulled back during the exposure to allow for the injection of pentobarbital (100 mg/kg) while the animal continued to inhale chloroprene. Blood was removed directly from the mouse via arterial-side cardiac puncture while the mouse was still housed in the syringe and breathing chloroprene.

Plethysmography

A total of 16 mice (4 per exposure group including air controls) were used for the purpose of collecting tidal volume and breathing frequency. Data were acquired using modified nose-only Buxco plethysmograph tubes for pulmonary function monitoring. Data from control mice were collected prior to the first chloroprene exposure. Plethysmography data from both control and exposed mice were collected for 2–3 hr.

Blood sampling

Whole blood was collected at 0.5, 3, and 6 hr during exposure and 5, 10, and 15 min post-exposure. Whole blood collection during chloroprene exposures (0.5, 3, and 6-hr time points) were done using the specially designed nose only exposure tubes described above.

Blood analysis

Quantification of chloroprene in whole blood was conducted by headspace sampling with analysis by gas chromatography mass spectrometry (GC/MS). The sampling method to be used, headspace analysis, as well as the GC/MS method were based on the previously published method for the analysis of 1,3-butadiene in whole blood from mice and rats (Himmelstein et al. 1994).

Briefly, 200 µL of whole blood, obtained by cardiac puncture, was transferred into pre-labeled, capped, and weighed airtight headspace vials (1.5 mL autosampler vial). Sample vials were weighed to obtain an accurate estimate of sample size and allowed to equilibrate at room temperature for 2 hr. Once equilibration was complete, samples were analyzed using an Agilent 5973 mass spectrometer coupled to an Agilent 6890 gas chromatograph. The mass spectrum was run in electron impact mode with selective ion monitoring (instrumental conditions are listed below).

Calibration curves were prepared by spiking stock control whole blood with known amounts of chloroprene obtained as a certified standard solution of chloroprene in methanol. Quality control samples were prepared by spiking control rat plasma with a certified chloroprene standard. QC samples were spiked to low (near the first calibration point), medium (near the middle of the calibration curve), and high (near the highest point of the calibration curve) levels. Aliquots of the prepared QC's were placed in sealed GC vials (3 aliquots for each level, 9 total) and kept frozen at −80 °C until required (GC vials had a minimum of headspace prior to freezing). On the blood collection days, a low-, middle-, and high-level QC was thawed and allowed to come to room temperature for 4 hr. After this time, the QC samples were "sampled" with a syringe identical to those being used for the collection of whole blood, placed in a GC vial in a manner identical to that of the whole blood collection, and analyzed along with the samples and standards.

Additional details of the nose-only inhalation study can be found in IISRP (2009b).

Chloroprene PBPK model

The development and documentation of the chloroprene PBPK model has been conducted in a transparent manner consistent with the WHO/IPCS (2010) guidance on PBPK modeling. The following sections describe the basis for the model structure and parameterization, as well and the

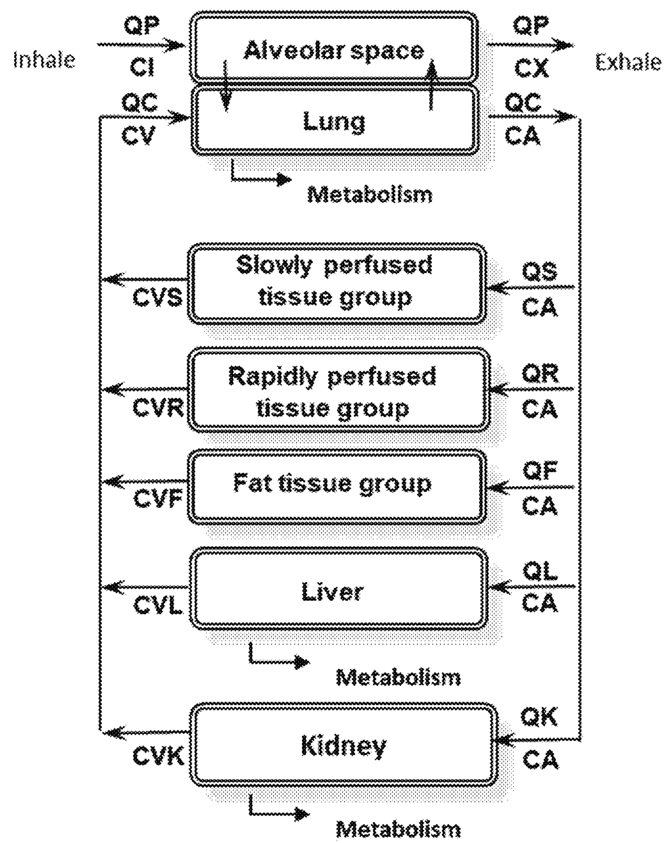

Figure 1. Chloroprene PBPK model diagram. QP: alveolar ventilation; CI: inhaled concentration; CX: exhaled concentration; QC: cardiac output; CA: arterial blood concentration; CV: venous blood concentration; QS, CVS: blood flow to, and venous concentration leaving, the slowly perfused tissues (e.g., muscle); QR, CVR: blood flow to, and venous concentration leaving, the richly perfused tissues (most organs); QF, CVF: blood flow to, and venous concentration leaving, the fat; QL, CVL: blood flow to, and venous concentration leaving, the liver; QK, CVK: blood flow to, and venous concentration leaving, the kidney.

methods used for sensitivity/uncertainty analysis and risk assessment application of the model.

Model structure

The structure of the PBPK model used in this study (Figure 1) is based on the PBPK model of chloroprene described in Himmelstein, Carpenter, Evans, et al. (2004), as modified by Yang et al. (2012). As in previous models of volatile organic compounds (Ramsey and Andersen 1984; Andersen et al. 1987), the blood is described using a steady-state approximation and the model assumes blood-flow limited transport to tissues and venous equilibration of tissues with the blood. Metabolism is described in the liver, lung and kidney using Michaelis-Menten saturable kinetics.

Model parameters

All physiological parameters in the model for mouse, rat and human (Table S-1 in Supplemental Materials A) are taken from Brown et al. (1997) except for the cardiac output in the mouse and the alveolar ventilation and cardiac output in the human. While the alveolar ventilation in the mouse is taken from Brown et al. (1997), relying on the value of cardiac output reported in Brown et al. (1997) would result in a value of 11.6 L/hr/bw$^{3/4}$ for cardiac output (QCC). If used with the Brown et al. (1997) value of 29.1 L/hr/bw$^{3/4}$ for alveolar ventilation (QPC), this would result in a serious mismatch between ventilation and perfusion (V/Q ratio $\gg$1). Andersen et al. (1987), the developers of the PBPK model for methylene chloride that was used in the USEPA (2011) IRIS assessment, argued that it would be more biologically realistic to assume that the V/Q ratio was close to 1 at rest, and stated that their previous experience with PBPK modeling of data on clearance of chemicals in the mouse under flow-limited metabolism conditions supported the use of a higher value for QCC. Therefore, the value of QCC in the current model was calculated by dividing the alveolar ventilation from Brown et al. (1997) by a MCMC estimate of $V/Q = 1.45$ for the mouse based on pharmacokinetic data for exposures to another volatile organic chemical, methylene chloride (Marino et al. 2006), which was used in the USEPA (2011) inhalation cancer risk assessment for that chemical. In the case of the human, it is more appropriate to use the default EPA ventilation rate of 20 L/day, reflecting an average activity level, rather than a resting value (Clewell et al. 2001). Since the values for alveolar ventilation and cardiac output in Brown et al. (1997) are resting values, we used the values calculated for the PBPK model of vinyl chloride (Clewell et al. 2001), which was used in the USEPA (2000) cancer risk assessment for that chemical. The parameter values, which were calculated to be consistent with the USEPA default ventilation rate of 20 L/day, were QPC = 24.0 L/hr/bw$^{3/4}$ and a QCC of 16.5 L/hr/bw$^{3/4}$ (V/Q ratio of 1.45).

Apart from the physiological parameters, the model parameters are based entirely on *in vitro* data. The partition coefficients (Table S-2 in Supplemental Materials A) were calculated from the results of *in vitro* vial equilibration data reported by Himmelstein, Carpenter, Evans, et al. (2004), using the partition coefficients for muscle and kidney to represent the slowly and rapidly perfused tissues, respectively. To obtain the model parameters for metabolism in the liver, lung and kidney, the original *in vitro* chloroprene metabolism time-course data (Himmelstein, Carpenter, and Hinderliter 2004; IISRP 2009a) were re-analyzed using a MCMC analytical approach similar to the one performed in Yang et al. (2012). The key differences between the new analysis and the original Yang et al. (2012) analysis were: (1) the incorporation of an additional parameter in the analysis of the *in vitro* metabolism data (*Kgl*) to describe the rate of transfer of chloroprene from the headspace to the media in the metabolism studies, (2) the use of updated tissue microsomal protein concentrations for scaling the *in vitro* results to *in vivo* values appropriate for the PBPK model, and (3) the adoption of a previously published approach for estimating the metabolism parameters in the human lung (Andersen et al. 1987).

Re-estimation of in vitro metabolism parameters: Schlosser et al. (1993) suggested that mass transport limitations should be assessed when estimating metabolism from *in vitro* experiments conducted with volatile compounds where there is an air:liquid interface. Since mass transport limitation was not addressed in the *in vitro* metabolism studies conducted with chloroprene (Himmelstein, Carpenter, and Hinderliter 2004; IISRP 2009a), a new experimental study was performed to estimate a *Kgl* for chloroprene following a protocol based on that in Schlosser et al. (1993). The new experimental study, which is described in Supplemental Materials B, resulted in an estimated value of 0.024 L/hr for *Kgl*, similar to the value previously reported for benzene (Schlosser et al. 1993). However, this experimentally estimated value of *Kgl* was not consistent with the high rates of liver metabolism observed at low concentrations of chloroprene; that is, the mass transport associated with a *Kgl* of 0.024 L/hr was too slow to support the observed rates of metabolism in the media.

We considered it likely that the much faster uptake of chloroprene in the metabolism studies than in the *Kgl* study was due to more effective mixing during the incubations, together with nonspecific surface binding of chloroprene to the microsomes, which provide a lipophilic binding component in the aqueous media. No microsomes were present in the *Kgl* experiments for chloroprene or benzene (Schlosser et al. 1993). Although the rate of shaking in the metabolism studies (Himmelstein, Carpenter, and Hinderliter 2004; IISRP 2009a) was not reported, we were able to determine that these studies used a Gerstel MPS2 autosampler with an agitating heater, which was set to an agitation rate of 500 rpm (Himmelstein 2019, personal communication), in comparison to the 60 rpm agitation rate used in Schlosser et al. (1993) and the present study.

To account for this difference in agitation rates, it was suggested (Paul Schlosser, personal communication) that the value of *Kgl* in the metabolism studies was likely to be higher than the value in the new experimental study by roughly the ratio of the mixing rates, that is, *Kgl*(metabolism studies) = *Kgl*(experimental study) × 500/60 = 0.024 × 500/60 = 0.2 L/hr. To confirm this expectation, we conducted a new MCMC analysis to simultaneously estimate *Kgl*, *V*max and *Km* from the metabolism data for the male mouse (Himmelstein, Carpenter, and Hinderliter 2004), which provided the strongest information regarding the dose-response for the clearance of chloroprene in the vials. The resulting value of *Kgl* estimated from this analysis was 0.22 L/hr, with a 95% confidence interval of 0.19–0.33 L/hr, consistent with the estimated value. The estimated value was then used in the re-estimation of the metabolism parameters for all tissues (Supplemental Materials B). The results of the new *in vitro* metabolism parameter estimation are provided in Table S-3 in Supplemental Materials A.

Selection of tissue scaling parameters: Based on a review of the literature (Supplemental Materials C), an updated set of scaling parameters was chosen: 35, 45, and 40 mg protein/g liver for mice, rats, and humans, respectively, (Medinsky et al. 1994 for mouse, Houston and Galetin 2008 for rat, Barter et al. 2007 for human). For the lung, 20 mg protein/g was selected for all species (Medinsky et al. 1994). The microsomal content of kidney was 18 mg protein/g for mouse and rat and 11 mg protein/g human (Yoon et al., 2007 for mouse and rat; Scotcher et al., 2017 for human). The maximum velocity and 1st order clearance rate constants were scaled allometrically (mg/hr/$BW^{0.75}$ or L/hr/$BW^{0.75}$) using the species and sex specific time and survival weighted average BW from the control group reported in the chloroprene bioassay (NTP 1998) for mouse and rat and 70 kg for human. The *in vivo* metabolism parameters derived using the revised scaling parameters are listed in Table S-4 in Supplemental Materials A and the IVIVE calculations are provided in Supplemental Materials D.

Estimation of chloroprene metabolism in the human lung: Unfortunately, we found that the extremely low rates of chloroprene metabolism observed in the human lung (Himmelstein, Carpenter, and Hinderliter 2004) made parameter estimation for this tissue highly uncertain. The 95% confidence interval for human lung metabolism in the new MCMC analysis ranged from near zero (7.5×10^{-23}) to 0.44 L/hr/g microsomal protein, with a mean that was also near zero (1.5×10^{-11}). Therefore, this posterior distribution was only used in the PBPK model uncertainty analysis, while in the application of the model to calculate dose metrics, we estimated the metabolism parameter for the human lung using the approach used in the USEPA (2011) risk assessment for methylene chloride, which relied on the PBPK model developed by Andersen et al. (1987). In that model, the *Km* for metabolism in the human lung was assumed to be the same as the *Km* in the human liver, and the *V*max in the human lung was calculated from the *V*max in the human liver using a parameter (*A*1) derived from the ratio of the specific activities for metabolism of 7-ethoxycoumarin, a well-studied CYP2E1 substrate, in liver and lung (Lorenz et al. 1984).

Model simulations

The previously published version of the chloroprene PBPK model (Yang et al. 2012), which was written in the Advanced Continuous Simulation Language (ACSL), was translated into R, an open source programing language, to improve its portability. The R code for the model is included in Supplemental Materials E. The full model code, including the scripts for running the model, is available from the authors on request.

To model the experimental data from the nose-only inhalation exposures reported here, only the alveolar ventilation and cardiac output were altered. The average ventilation rate measured in the mice during the study was used to calculate an alveolar ventilation for use in the model, assuming 2/3 of total ventilation is alveolar (Brown et al. 1997), and the cardiac output was then calculated by dividing the alveolar ventilation by the *V/Q* ratio from Marino et al. (2006), as described in the results.

Parameter sensitivity analysis

Parameter sensitivity analysis was conducted with the model under two scenarios: (1) the prediction of blood concentrations in the mouse nose-only study, and (2) the prediction of dose metrics for the mouse bioassay exposures and for the human at 1 ppm continuous exposure. The results were calculated as normalized sensitivity coefficients (fractional change in prediction divided by fractional change in parameter) for parameters with a coefficient greater than 0.1 in absolute magnitude. A positive coefficient indicates the direction of change of the prediction is the same as the direction of change of the parameter. The parameters were changed by 1%, one at a time.

Risk assessment application

Consistent with previous PBPK modeling of chloroprene (Himmelstein, Carpenter, Evans, et al. 2004; Yang et al 2012), the dose metric calculated with the PBPK model for derivation of an IUR is micromoles of chloroprene metabolized in the lung per gram lung per day. This dose metric was chosen because the lung is the tissue with the highest tumor incidence in the chloroprene inhalation bioassays (NTP 1998) and the carcinogenicity of chloroprene in rodents is believed to result from its metabolism to reactive epoxides in the target tissue (Himmelstein, Carpenter, and Hinderliter 2004; Himmelstein, Carpenter, Evans, et al. 2004). The dose metric selected for chloroprene is consistent with the dose metrics used in previous PBPK-based risk assessments for both vinyl chloride (USEPA 2000; Clewell et al. 2001) and methylene chloride (Andersen et al. 1987; USEPA 2011), which were also based on the production of reactive metabolites.

To estimate an IUR, the PBPK model was first used to simulate the NTP (1998) bioassay exposures (12.8, 32 and 80 ppm; 6 hr/day, 5 days/week) and calculate the corresponding target tissue dose metrics (in this case, average daily production of epoxide metabolites in the lung per gram lung). Consistent with USEPA practice, the PBPK-based target tissue dose metrics were then used in place of the air concentrations in BMDS, the USEPA's Benchmark Dose modeling program, to estimate a 95% lower-bound estimate of the dose metric associated with a tumor risk of 0.01 (the $BMDL_{01}$). The PBPK model was then used to estimate the same target tissue dose metric in a human exposed continuously to chloroprene at a concentration of 1 μg/m^3 for their lifetime. Due to the uncertainty associated with the low rate of chloroprene metabolism in the human lung observed in the *in vitro* studies (Himmelstein, Carpenter, and Hinderliter 2004), the human lung metabolism parameters were estimated using the approach in the methylene chloride PBPK-based risk assessment (Andersen et al. 1987), where the affinity of lung metabolism was assumed to be the same as in the liver, and the relative capacity of lung to liver was based on *in vitro* data for a standard substrate, 7-ethoxycoumarin. This was done to provide a more conservative (higher) estimate of the human dose metric than would be obtained from the *in vitro* data for chloroprene. The IUR was then estimated by the following formula:

$$\text{Risk at } 1\ \mu g/m^3 = 0.01 \times \left(\text{human dose metric at } 1\ \mu g/m^3\right) / (\text{mouse dose metric at } BMDL_{01})$$

Uncertainty analysis

Monte Carlo uncertainty analysis was conducted with the chloroprene PBPK model to estimate the uncertainty in the dose metrics resulting from the uncertainty in the estimates of the model parameters, particularly the metabolism parameters estimated from the *in vitro* studies (Himmelstein, Carpenter, and Hinderliter 2004; IISRP 2009a). For the purpose of evaluating uncertainty in the dose metrics, the posterior distributions for all metabolism parameters from the MCMC analysis were used, including the metabolism parameter for the human lung (as opposed to the use of the approach used in Andersen et al. (1987) for methylene chloride, which was used in this analysis for the risk assessment calculations). Variability in the physiological and partitioning parameters was taken from Clewell and Jarnot (1994).

Crystal Ball Release 11.1.2.3.850 was used to obtain the parameter values for the mouse and human parameters used in the PBPK model. The values reported in Table 2 were used to define the specified distributions for the physical parameters. Most of the parameter distributions were truncated on both the lower and upper ends of the distribution at mean ± 2.5 × std except where noted (i.e., parameters where the lower bound would be less than zero). Normal distributions were used for the body weight, tissue volumes and blood flows. Log-normal distributions were used for the partition coefficients. Five thousand iterations were performed in Crystal Ball and the data from the iterations were extracted for use as input values for the PBPK model.

The metabolism parameters were obtained by random selection without replacement from the last 5000 iterations of the Markov Chain Monte Carlo simulation, to pair with the iterations of the parameters estimated using Crystal Ball. The mouse metabolism parameters were randomized separately from the human metabolism parameters.

The target tissue dose metrics (average daily production of epoxide metabolites in the lung per gram lung) were estimated using these parameters for the mouse bioassay exposures (12.8, 32 and 80 ppm; 6 hr/day, 5 days/week) in the PBPK model. Human dose metrics were obtained using 5000 iterations of the human parameters obtained from Crystal Ball with a constant external exposure concentration of 1 μg/m^3.

The target tissue dose metrics for the bioassay exposures were then used in time-to-tumor modeling of the incidence of lung alveolar/bronchiolar adenomas and carcinomas with the Multistage–Weibull model provided with the EPA BMDS software (February 25, 2010 version). The Multistage Weibull model has the following form:

$$P(d,t) = 1 - \exp[-(b_0 + b_1 \times d + b_2 \times d^2 + \cdots + b_k \times d^k) \times (t - t_0)^c]$$

BMDS was used to obtain a benchmark dose (BMD) and the 95% lower bound on that dose (BMDL) associated with a benchmark risk (BMR) of 0.01 for each of the 5000 iterations. The data used with the Multistage–Weibull model was the NTP (1998) female mouse combined incidence of alveolar/bronchiolar adenomas and carcinomas. For this dataset, the one animal for which the class of tumor was unknown was excluded from the analyses and the BMD and $BMDL_{01}$ calculations were for incidental extra risk of 0.01 at $t = 105$ weeks.

In addition to the target tissue dose metrics for the mice, human dose metrics were obtained using the 5000 iterations of the human parameters obtained from Crystal Ball and a constant external exposure concentration of 1 μg/m^3. As a final step in calculating the IURs, the equation below was used:

$$\text{Risk at } 1\ \mu g/m^3 = 0.01 \times (\text{human dose metric at } 1\ \mu g/m^3) / (\text{mouse dose metric at } BMDL_{01})$$

Each of the 5000 iterations were used to calculate an IUR by pairing the randomized mouse BMDL01 with a randomized human dose metric at 1 μg/m^3. Since the mouse and human parameters were randomized without replacement and independently before the calculation of the dose metrics, the human and mouse dose metrics were paired on a one-to-one basis.

Correlation analysis was performed between the calculated $BMDL_{01}$s and the PBPK model parameters used in the calculation of the dose metrics.

Results

Chloroprene exposure atmospheres

Chloroprene concentrations were monitored in the nose only chambers during the 13, 32, and 90 ppm exposures, as well as in the control nose-only tower. All three target concentrations were well within 10% of their nominal levels.

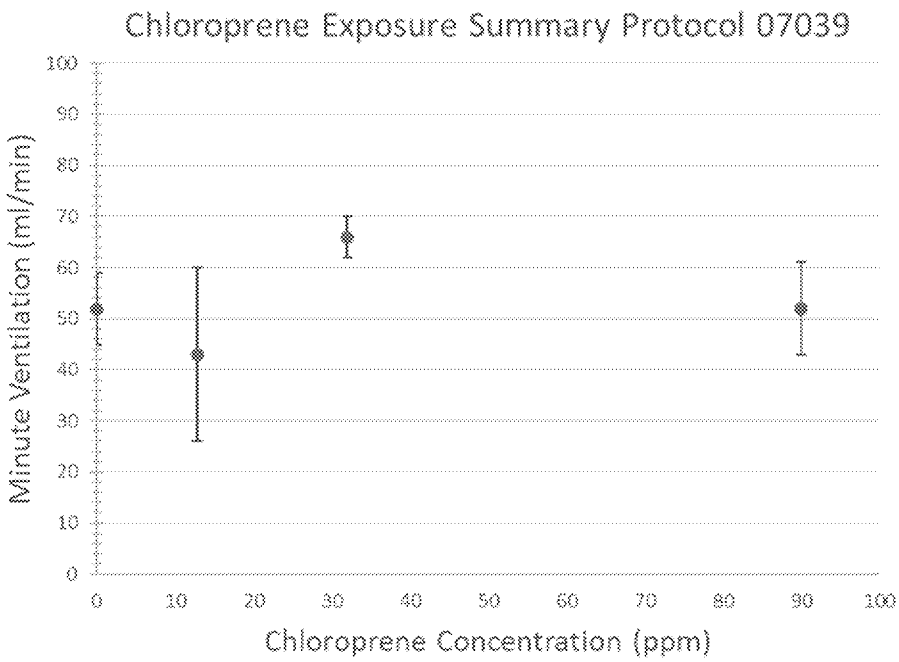

Figure 2. Measured minute ventilation during exposures.

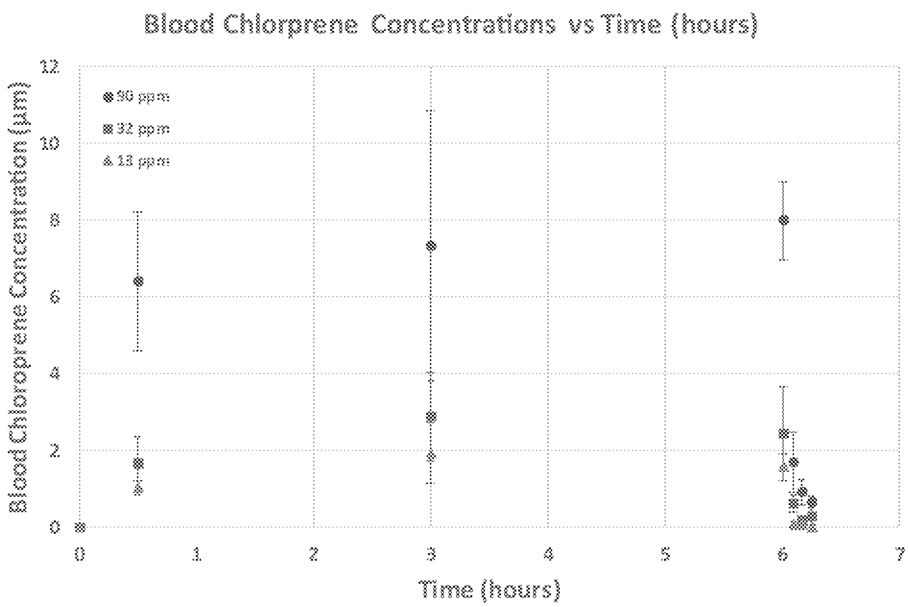

Figure 3. Blood chloroprene concentrations during and following a single nose-only exposure of female B6C3F1 mice to chloroprene at 13, 32 and 90 ppm for 6 hr. Average blood chloroprene concentrations (symbols) and standard deviations (error bars) are shown for each treatment group.

Plethysmography

Figure 2 shows the measured minute volumes for the three exposure groups and controls. The data is represented as average values (diamonds) with standard deviation error bars. The data is provided in Table S-5 in Supplemental Materials A. There is no evidence of a concentration-related effect of short-term exposure to chloroprene on ventilation in mice. The average ventilation rate across all four exposure groups, including controls, was 56.2 mL/min. The average body weight for the mice in the study was 22 g; therefore, this ventilation rate equates to a model parameter for alveolar ventilation (QPC) of 39.4 L/hr/bw$^{3/4}$. The corresponding model value of QCC in this study is obtained by dividing QPC by the V/Q ratio of 1.45 for the mouse (Marino et al. 2006), yielding a value for QCC of 27.2 L/hr/bw$^{3/4}$, which compares well with the QCC of 24.2 estimated for mouse exposures to methylene chloride (Marino et al. 2006).

Blood chloroprene concentrations

Figure 3 shows the average chloroprene blood concentrations for all three single day exposures (Data are provided in Table S-6 of Supplemental Materials A). Average blood

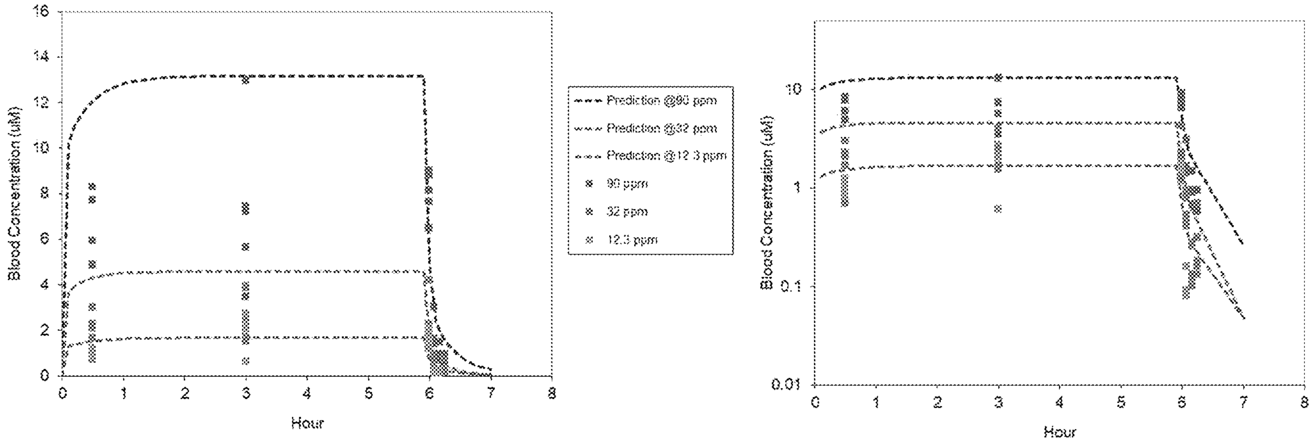

Figure 4. PBPK model predicted (dotted lines) and measured (symbols) blood concentrations during and following 6-hr exposures of B6C3F1 mice to chloroprene at 12.3 (green), 32 (fuchsia) or 90 (blue) ppm. The same data and model predictions are shown using a linear y axis (left) and a logarithmic y axis (right). The linear plot provides a better comparison for concentrations, whereas the logarithmic plot provides a clearer comparison for the post-exposure clearance.

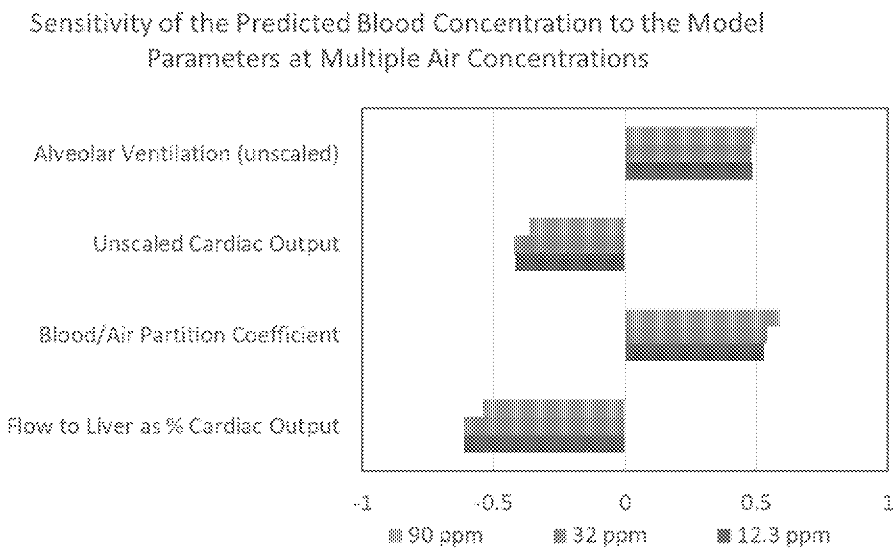

Figure 5. Parameter sensitivity coefficients for the chloroprene PBPK model for the prediction of blood concentrations in the nose-only study.

chloroprene concentrations are represented by the symbols with standard deviations for each treatment group represented with error bars.

PBPK modeling of the nose-only inhalation study

The nose-only study described above was simulated with the chloroprene PBPK model using the parameters in Tables S1, S2, and S4, except for QPC and QCC, where the study-specific values derived from the plethysmography data were used. As shown in Figure 4, using only *in vitro*-derived metabolism and partitioning parameters the model predictions for blood concentrations during and after the 6-hr chloroprene exposures are in good agreement with the data collected in the study, consistent with the WHO/IPCS (2010) guidance on PBPK modeling, model predictions are generally within roughly a factor of two of the means of the experimental data. It was not necessary to adjust any of the model parameters to provide agreement with these new data.

PBPK model parameter sensitivity

As shown in Figure 5, when simulating the nose-only exposures only 4 model parameters have sensitivity coefficients greater than 0.1 in absolute magnitude: alveolar ventilation, cardiac output, blood:air partition coefficient and fractional blood flow to liver. All of these parameters were either directly measured or based on data from the literature, as described in the Methods, and can be considered to have low uncertainty. When predicting lung dose metrics in the female mouse (Figure 6), the sensitive parameters include the same parameters as those for the predictions of blood concentrations, with the addition of the parameters for lung metabolism and the body weight. The sensitive parameters for predictions of lung dose metrics in the human (Figure 7) are the same as those in the mouse, except that a single clearance parameter is used in the human due to the low rate of metabolism in the human lung. These analyses of the sensitivity of the model to uncertainty in its parameters suggest that performing a human *in vivo* validation study would be unlikely to provide a significant added value for model evaluation.

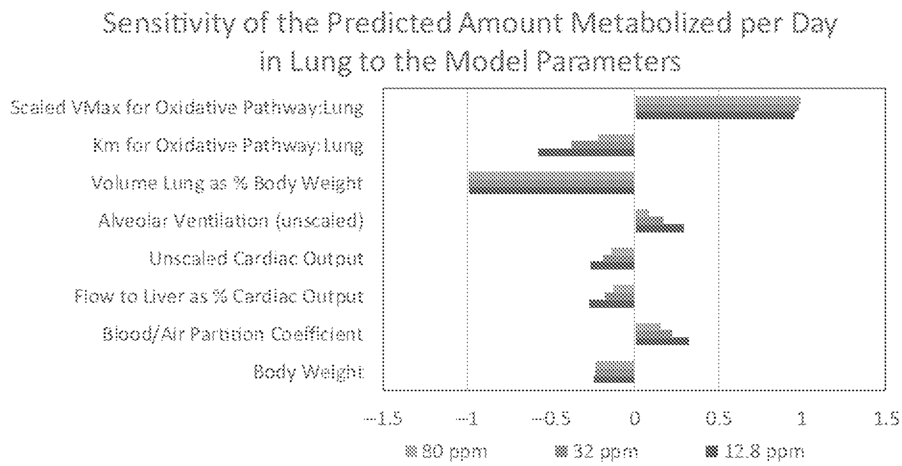

Figure 6. Parameter sensitivity coefficients for the chloroprene PBPK model for the prediction of lung dose metrics in the female mouse for exposures in the 2-year bioassay.

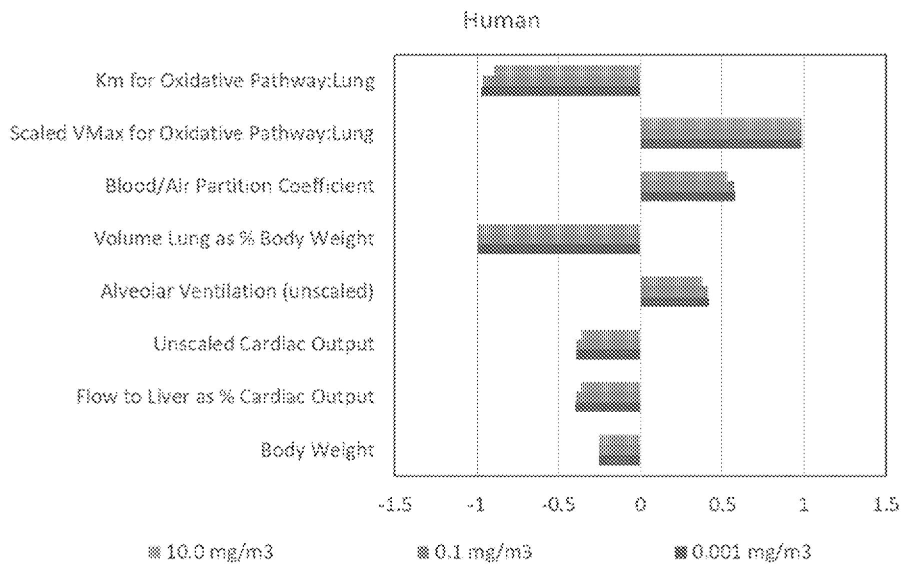

Figure 7. Parameter sensitivity coefficients for the chloroprene PBPK model for the prediction of lung dose metrics in the human for continuous exposures.

PBPK-based risk assessment for chloroprene lung carcinogenicity

The dose metrics for lung metabolism in the female mouse bioassay and for human continuous exposure are shown in Table 1. These estimates were obtained with the chloroprene PBPK model using the parameters in Tables S1, S2, and S4.

Using the dose metrics from the model, the $BMDL_{01}$ in the mouse estimated with BMDS was 0.0092, resulting in an estimated IUR of 0.01*3. $36 \times 10^{-6}/0.0092 = 3.65 \times 10^{-6}$ (μg/m^3)$^{-1}$, a factor of 137 lower than the USEPA (2010) IUR of 5.0×10^{-4} (μg/m^3)$^{-1}$. As in the risk assessment for methylene chloride (USEPA 2011), this risk at 1 μg/m^3 cannot be used to estimate risks at higher exposure concentrations due to the saturation of metabolism in the lung. As illustrated in Table 1, risks above 1 ppm increase less than linearly.

Table 1. Dose metrics for lung metabolism (average mg metabolized per gram lung per day) in the female mouse bioassay and for human continuous exposures.

Exposure	Concentration	Dose metric
Female mouse bioassay	12.8 ppm	1.00
	32 ppm	1.58
	80 ppm	2.15
$BMDL_{01}$		0.0092
Human continuous	100 ppm	3.48×10^{-2}
	10 ppm	2.76×10^{-2}
	1 ppm	9.00×10^{-3}
	0.1 ppm	1.16×10^{-3}
	0.01 ppm	1.19×10^{-4}
	1 ppb	1.2×10^{-5}
	1 μg/m^3	3.36×10^{-6}
IUR (μg/m^3)$^{-1}$		3.65×10^{-6}

Also shown are the $BMDL_{01}$ calculated from the mouse dose metrics and the resulting IUR.

PBPK model uncertainty analysis

Monte Carlo uncertainty analysis was performed to evaluate the impact on risk estimates associated with uncertainty in the PBPK model parameters. The input parameter distributions are provided in Table S-6 in Supplemental Materials A. The results of the analysis are presented in Table 2.

The results of the Monte Carlo uncertainty analysis indicate that the uncertainty in the predictions of the model for

Table 2. Percentiles of daily lung metabolism dose metric distributions in the mouse bioassay and for a human continuous exposure to 1 μg/m^3 chloroprene, as well as the resulting BMDLs and IURs, using the newly estimated parameters in this study based on the *in vitro* assays with chloroprene (including the estimated first order rate of metabolism of chloroprene in the human lung).

90% Confidence intervals from Monte Carlo analysis			
Exposure	Concentration	5th Percentile	95th Percentile
Female mouse bioassay	12.8 ppm	0.5	2.03
	32 ppm	0.85	3.25
	80 ppm	1.18	4.44
BMDL		0.0036	0.020
Human continuous	1 μg/m^3	1.64×10^{-26}	2.71×10^{-6}
IUR (μg/m^3)$^{-1}$		1.77×10^{-26}	3.38×10^{-6}

the animal dose metrics and the resulting BMDLs is only on the order of a factor of 2. However, the uncertainty in the human dose metric, and the resulting IUR, is very large. This uncertainty results from the very low rate of human lung metabolism observed in the *in vitro* studies conducted with chloroprene (Himmelstein et al. 2001; Yang et al. 2012). However, the 95th percentile upper bound risk estimate of 3.38×10^{-6} (μg/m^3)$^{-1}$ is lower than the risk estimate of 3.65×10^{-6} (μg/m^3)$^{-1}$ in Table 2 that was obtained using the approach from Andersen et al. (1987), which was based on relative CYP activities in human liver and lung. Thus, reliance on the uncertain *in vitro* data for human lung metabolism of chloroprene would result in lower risk estimates than those in Table 1.

It should be emphasized that the parameters in the chloroprene PBPK model represent estimates for an average mouse or human and this Monte Carlo analysis does not address human inter-individual variability. The intention of the Monte Carlo analysis conducted with the chloroprene PBPK model was to characterize the uncertainty in model predictions of risk for an average individual. Previous evaluations of the impact of interindividual variability in pharmacokinetics on PBPK model-based risk estimates (Clewell and Andersen 1996) have suggested that the confidence interval for inter-individual variability in human internal dose, is generally consistent with the default expectation of a factor of ten; that is, the ratio of a sensitive individual (95th percentile) to an average individual is on the order of a factor of 3. More recently, a MCMC evaluation of the variability in human risk estimates with the PBPK model for methylene chloride (David et al. 2006), which included consideration of a polymorphism for the metabolism of methylene chloride, found that the upper 95th percentile risk in the US population was within a factor of 3 of the mean risk estimate.

Discussion

In this study we characterized the time course blood concentrations of chloroprene in female B6C3F1 mice during and following a single 6-hr nose-only inhalation exposure over the range of concentrations used in the NTP (1998) bioassays. These data, including both whole blood concentrations and respiratory parameters (breathing frequency and tidal volume) during and after these exposures provide a reliable basis for evaluating the ability of the chloroprene PBPK model to predict *in vivo* pharmacokinetics in the bioassays. We have then applied the PBPK model in an inhalation cancer risk assessment that considers species differences in pharmacokinetics. The IUR obtained with the PBPK model was 137-fold lower than the IUR published by USEPA (2010) based on inhaled chloroprene concentration. The principal reason for the lower human risks estimated with the PBPK model as compared to the USEPA (2010) assessment, which was based on inhaled chloroprene concentration, is the use of a pharmacokinetic dose metric for cross-species extrapolation that considers the impact of metabolic differences. The use of a PBPK model for this purpose is consistent with the conclusion of the National Academy of Science (NRC 1987) that: "relevant PBPK data can be used to reduce uncertainty in extrapolation and risk assessment." The application of the model is also consistent with recommended practice for the use of PBPK modeling in risk assessment (WHO/IPCS 2010).

It is important to note that, due to the low rates of metabolism in the *in vitro* assays for the rat and human lung, it is only possible to estimate a pseudo-first-order clearance for these tissues. Therefore, the original chloroprene model (Himmelstein, Carpenter, Evans, et al. 2004; Yang et al. 2012) used a linear description of metabolism in these tissues, which is only appropriate in the concentration range below the *Km* in the lung, a parameter that is highly uncertain in the rat and human. Thus model-based metabolism predictions for human exposures significantly greater than 1 ppm would greatly overestimate the associated risk. One approach for dealing with the inability to estimate the value of *Km* in the human lung is to use the value of *Km* estimated in the human liver. This approach was used in the PBPK model for methylene chloride (Andersen et al. 1987) and in the present analysis. The impact of saturable metabolism on human dose metric predictions is shown in Figure 8. Without estimating a value for *Km*, the model-predicted risks above 1 ppm would continue to increase at a biologically implausible rate.

Interestingly, comparison of the *Km*s for chloroprene in liver and lung for male and female mice (Table S-3), which are based on the strongest data sets for estimating *Km*s, suggests that *Km* may be higher (lower affinity) in the mouse lung than in the mouse liver. This difference in apparent affinities in mouse liver and lung is consistent with differences in the relative tissue abundances of the murine CYP2E1 and CYP2F isozymes, both of which exhibit high affinities for chlorinated alkenes (Yoon et al. 2007). Whereas CYP2E1 is the predominant high affinity isozyme in the mouse liver, CYP2F is the predominant high affinity isozyme in the mouse lung (Yoon et al. 2007) and, consistent with the estimated *Km*s for chloroprene, the affinity of rCYP2E1 is roughly 3-fold higher (lower *Km*) than rCYP2F2 (Simmonds et al. 2004). However, since there is no evidence of CYP2F activity in the primate lung (Baldwin et al. 2004), no difference in *Km*s in the human lung and liver would be expected, so the estimation of human lung *Km* based on the human liver *Km* is appropriate.

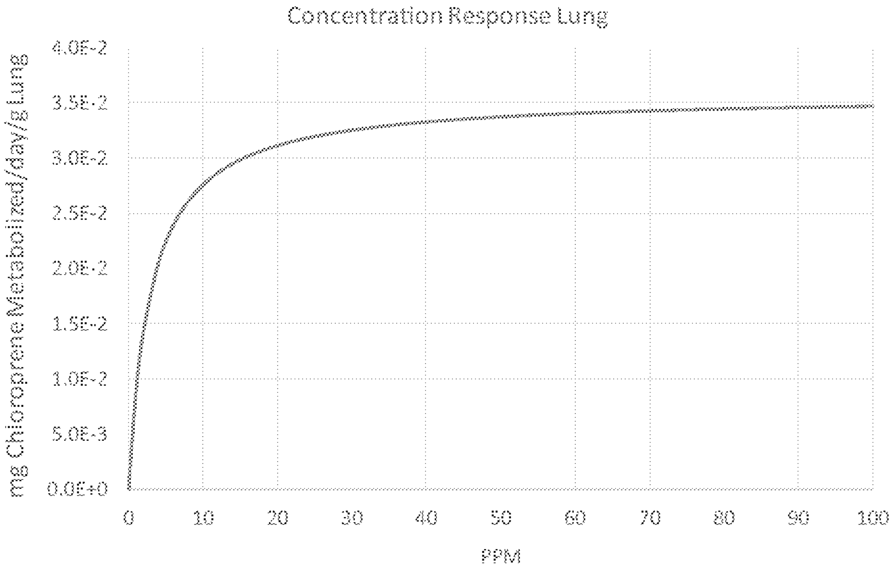

Figure 8. Inhaled concentration dependence of lung metabolism in the human for continuous exposures to chloroprene predicted with the PBPK model.

Not unexpectedly, in our re-analysis we found that the extremely low rates of chloroprene metabolism observed *in vitro* in the human lung (Himmelstein, Carpenter, and Hinderliter 2004) made parameter estimation for this tissue highly uncertain. The 90% confidence interval for human lung metabolism in the new MCMC analysis ranged from near zero (1.2×10^{-22}) to 0.39 L/hr/g microsomal protein. Therefore, we estimated the metabolism parameter for the human lung using the same approach as the USEPA (2011) risk assessment for methylene chloride; that is, the *Km* for metabolism in the human lung was assumed to be the same as the *Km* in the human liver, and the *V*max in the human lung was calculated from the *V*max in the human liver using a parameter (*A*1) derived from the ratio of the specific activities for metabolism of 7-ethoxycoumarin, a well-studied CYP2E1 substrate, in liver and lung (Lorenz et al. 1984). Using the human value of *A*1 (0.00143), together with the estimated values of *V*max and *Km* in the human liver from the MCMC analysis (0.052 μmol/hr/mg protein and 0.32 μmol/L), results in a metabolic clearance in the lung of 0.16 L/hr/g microsomal protein. This human lung metabolism estimate is similar to the value of 0.32 L/hr/g microsomal protein previously estimated for chloroprene by Yang et al. (2012) and is within the confidence interval estimated by our new analysis of the *in vitro* data. In support of the applicability of *A*1 to chloroprene, the value of *A*1 in the male mouse (0.414) from Lorenz et al. (1984) is close to the ratio of the *in vitro* *V*max in the lung and liver of the male mouse in our new analysis (0.56, see Table S-3). The value of *A*1 is also consistent with the reported ratio of total CYP2E1 plus CYP2F1 mRNA expression in human lung and liver of 0.00059 (Nishimura et al. 2003), which is about a factor of two lower than *A*1.

Selection of dose metric

The dose metric calculated with the PBPK model in this analysis is micromoles of chloroprene metabolized in the lung per gram lung per day (Himmelstein, Carpenter, Evans, et al. 2004; Yang et al. 2012). This dose metric was chosen because (1) the lung is the tissue with the highest tumor incidence in the chloroprene inhalation bioassays (NTP 1998) and (2) the carcinogenicity of chloroprene in rodents is believed to result from its metabolism to reactive epoxides in the target tissue (Himmelstein, Carpenter, and Hinderliter 2004; Himmelstein, Carpenter, Evans, et al. 2004). The dose metric selected for chloroprene is consistent with the dose metrics used in previous PBPK-based risk assessments for both vinyl chloride (USEPA 2000; Clewell et al. 2001) and methylene chloride (Andersen et al. 1987; USEPA 2011), which were also based on the rate of production of reactive metabolites. The dose metric selected for the liver carcinogenicity of vinyl chloride was total mg vinyl chloride metabolized per kg liver per day, representing the production of the reactive chloroethylene epoxide. Due to the presence of chlorine in the epoxides generated from the metabolism of chloroprene, they are considered likely to have a reactivity comparable to vinyl chloride (Haley 1978; Plugge and Jaeger 1979). The methylene chloride dose metric was average daily metabolism by the glutathione conjugation pathway in the lung per gram lung, which was selected based on evidence that the carcinogenicity of methylene chloride was associated with the local production of a reactive metabolite from the glutathione conjugate of methylene chloride. As with vinyl chloride and chloroprene, the assumption inherent in the dose metric was that the reactive metabolite would be completely consumed within the tissue where it was generated.

Himmelstein, Carpenter, Evans, et al. (2004) have previously demonstrated that using the PBPK dose metric is able to harmonize the dose-responses for lung tumors in mice, rats and hamsters. However, they only had metabolism data for male animals. Figure 9 shows an update of the analysis from Himmelstein, Carpenter, Evans, et al. (2004) that includes the results for the female mouse and rat. While the revised PBPK model is still able to demonstrate the

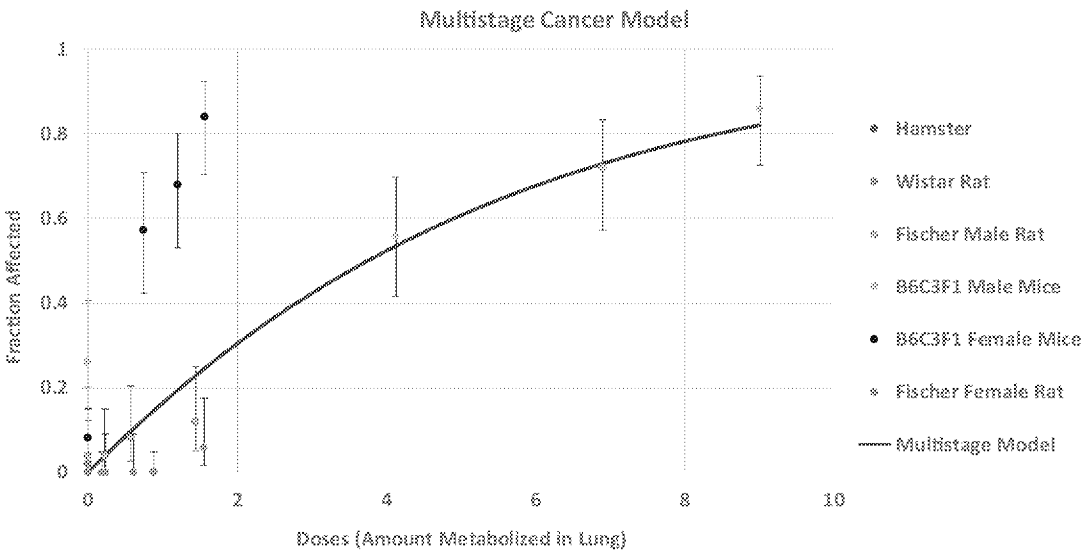

Figure 9. Comparison of dose-response for lung tumors in chloroprene bioassays in rodents.

consistency of the tumor incidence across male animals of different species and strains, female mice exhibit a higher tumor incidence than male mice at the same rate of lung metabolism.

This discrepancy could indicate either of two possibilities: (1) the selected dose metric, rate of metabolism of chloroprene in the lung, is incorrect, or (2) the female mouse lung is more sensitive to the effects of chloroprene metabolites than the male mouse lung. Relatively few studies have been conducted to explore gender differences in the responses to chemical insult in the mouse lung. However, Yamada et al. 2017, provides evidence of a proliferative response of Club cells to the toxicity of permethrin in the female mouse lung that is not observed in the male mouse lung, and studies of naphthalene lung toxicity have demonstrated a greater sensitivity of the female mouse lung to both acute and repeated toxicity (Van Winkle et al. 2002; Sutherland et al. 2012). The greater susceptibility to a proliferative response to lung toxicity in the female mouse appears to result from gender differences in the tissue response to damage rather than metabolism (Laura Van Winkle, personal communication). A study of the genomic responses in the lungs of female mice and rats to inhaled chloroprene (Thomas et al. 2013) also demonstrated a greater pharmacodynamic sensitivity of the female mouse. In this study, female mice and rats were exposed for up to three weeks to inhaled chloroprene concentrations that were chosen to result in similar rates of epoxide production in the two species. The study found that while the most sensitive tissue responses occurred at similar values of the metabolism dose metric, transcriptional evidence of oxidative stress occurred at much lower concentrations in the female mouse. The more sensitive response of the female mouse to oxidative stress and to a proliferative response may underlie the apparent potency difference indicated by Figure 9. Using the metabolism dose metric effectively ignores the greater sensitivity of the female mouse, which is health protective, since the greater sensitivity of the female mouse results in a lower BMDL01 than would be obtained from the male mouse.

The toxicity and carcinogenicity observed in rodents following exposure to chloroprene is believed to be related to the reactivity of the epoxides, 1-CEO and 2-CEO, that are formed by its metabolism (Himmelstein, Carpenter, and Hinderliter 2004). The use of a chloroprene PBPK dose metric that is based on total metabolism per gram lung represents a measure of the production of these metabolites but does not reflect any species differences that might exist in their clearance. However, due to the expectation that the rearrangement of 1-CEO and 2-CEO to reactive aldehydes is spontaneous and not enzymatically catalyzed, and that the reaction of the epoxides with glutathione is primarily related to direct GSH conjugation rather than enzymatic conjugation via glutathione transferases, clearance by these pathways would be expected to be identical across species, as was the case for methylene chloride, where the clearance of the chloromethylglutathione metabolite was non-enzymatic and rapid (Andersen et al. 1987). The only other clearance pathway, enzymatic hydrolysis of chloroprene by epoxide hydrolase, has been shown to be slower in mouse lung compared to human lung in the case of 1-CEO (Himmelstein, Carpenter, and Hinderliter 2004), and it is reasonable to assume that relationship for 2-CEO, which is too reactive to measure in vitro (Himmelstein, Carpenter, and Hinderliter 2004). would be similar. Thus, the total clearance of both epoxides is expected to be similar or greater in the human compared to the mouse, and the use of the dose metric based solely on production would provide a health-conservative (similar or higher) estimate of human risk compared to a dose metric that also considered clearance.

The risk assessment for vinyl chloride (USEPA 2000) demonstrated that the use of a PBPK model to estimate target tissue dose (based on total metabolism per gram liver per day) was able to produce similar human risk estimates using data from animal bioassays and human occupational exposures. As a similar test of the chloroprene PBPK model to support cross-species extrapolation, Allen et al. (2014) used a statistical maximum likelihood approach to compare risk estimates obtained using external (air concentration) and internal (PBPK model estimated) metrics for the female mouse bioassay and human occupational exposures. The analysis concluded that if inhaled concentration was used as the dose metric, the estimates of human cancer risk using animal and human data were statistically significantly different, whereas using the PBPK metric consistent risk estimates were obtained across species. As with vinyl chloride, the use of the PBPK-based metric effectively reconciled the differences in mouse and human low-dose risk estimates.

Use of in vitro metabolism data

The most notable aspect of the chloroprene PBPK model is that, apart from the physiological parameters, the parameters in the model are based on data derived solely from *in vitro* studies. The PBPK model for chloroprene is structurally similar to the PBPK model for methylene chloride (Andersen et al. 1987) and, just as in the case of the methylene chloride risk assessment, model predictions needed to support a risk assessment are critically dependent on parameters that can only be derived from *in vitro* metabolism experiments.

At the time the methylene chloride PBPK model was developed, the use of *in vitro* data to predict *in vivo* metabolism was a relatively new concept, but in the intervening years it has become common practice both for pharmaceuticals (Rostami-Hodjegan 2012) and environmental chemicals (Yoon et al. 2012). While regulatory agency acceptance of PBPK models that are not based primarily on *in vivo* data still presents a challenge (EURL ECVAM 2017), "next generation" physiologically based kinetic modeling (NG PBK, Paini et al. 2019) has gained widespread acceptance for supporting regulatory decision making. In this regard it is important to distinguish two forms of NG PBK: high-throughput IVIVE (HT-IVIVE) and chemical-specific PBPK/QIVIVE. In the HT-IVIVE methodology, a simplified generic pharmacokinetic model is applied across chemicals regardless of the potential impact of chemical-specific properties on the processes affecting their disposition and the nature of their metabolism. The simplified generic models used in HT-IVIVE necessarily ignore many factors that could be an important determinant of steady-state blood concentrations for a particular chemical, including incomplete absorption, presystemic intestinal metabolism, bypassing of hepatic presystemic metabolism by lymphatic uptake (in the case of lipophilic compounds), and active renal clearance or resorption. Due to the imprecision associated with this simplified generic approach (Wetmore et al. 2015; Wambaugh et al. 2015), HT-IVIVE is typically applied in screening approaches such as prioritization for further testing based on bioactivity concentrations from high-throughput testing. However, more exacting QIVIVE methods can be applied in chemical-specific PBPK modeling, and there are now many examples of published NG PBK models using these techniques to provide more accurate predictions of *in vivo* kinetics (Yoon et al. 2012; Paini et al. 2019). In the development of the chloroprene PBPK model we have followed the PBPK/QIVIVE approach described in Yoon et al (2012) and Paini et al. (2019). Going forward it will be important to develop a consensus on standard practices for IVIVE of metabolism in PBPK modeling in order to assist agencies in their evaluations.

Comparison of current MCMC analysis with analysis in Yang et al. (2012)

In their analysis of *in vitro* data on chloroprene metabolism, Yang et al. (2012) employed both a standard frequentist approach (referred to in their analysis as a "deterministic" approach) and an approach that used a Markov Chain Monte Carlo (MCMC) method (referred to as a "probabilistic" approach) with non-informative prior distributions for all estimated parameters. The use of non-informative priors allows this Bayesian approach to be interpreted from a frequentist perspective. As stated in the Yang et al. document, the two methods were compared to demonstrate that the they provided consistent estimates of metabolic parameter values. Yang et al. (2012) then relied on the MCMC-based estimates for developing dose metrics for chloroprene exposures in mouse, rat and human. Because it seeks a global optimum using a probabilistic direct search algorithm, MCMC is less likely than deterministic search algorithms to converge on a local optimum. Moreover, when used with non-informative priors, as in Yang et al. (2012), the posterior distribution represents the likelihood distribution for the parameter, and the mode of the distribution represents the maximum likelihood estimate (MLE). As pointed out in Chiu et al. (2007), the Bayesian approach, in principle, yields a more global characterization of parameter uncertainty than the local, linearized variance estimates provided by traditional optimization routines, which should be viewed as lower bound estimates of true parameter uncertainty. Because of its superior properties, we have also relied on the MCMC approach in our re-analysis of the original *in vitro* metabolism data.

The key difference between the MCMC analysis performed in this study and the original analysis (Yang et al. 2012) was that this re-analysis included an additional parameter (*Kgl*) for the *in vitro* experiments, representing the potential for a mass transport limitation for uptake of chloroprene from the air in the metabolism vials. To evaluate the impact of our re-analysis of the *in vitro* metabolism data using *Kgl* on predicted risk estimates, the PBPK model was also used to calculate dose metrics using the previously published metabolism parameters from Yang et al. (2012). Again, due to the high uncertainty in the estimated value of the human lung metabolism parameter, the approach using *A*1 from Andersen et al. (1987) was applied. The results with the two parameterizations are compared in Table 3.

Using the new parameters, estimated under the assumption of an air:liquid transport limitation in the in vitro studies, the mouse dose metrics increase by roughly 30–40% and the human dose metrics increase by roughly 40%, but the resulting risk estimates are similar, providing additional evidence of the robustness of the PBPK model-based risk estimates.

Table 3. Comparison of predictions of current model parameterization with previously published model (Yang et al. 2012).

Exposure	Concentration	Dose metrics Yang et al. (2012) parameters	Dose metrics Re-estimated parameters
Female mouse bioassay	12.8 ppm	0.75	1.00
	32 ppm	1.20	1.58
	80 ppm	1.57	2.15
$BMDL_{01}$		0.0073	0.0092
Human continuous	1 μg/m^3	2.7×10^{-6}	3.36×10^{-6}
IUR (μg/m^3)$^{-1}$		3.7×10^{-6}	3.65×10^{-6}

Use of in vivo data for PBPK model validation

PBPK modeling has now been applied in risk assessments for a variety of environmental chemicals by regulatory agencies worldwide. The development of these models has typically required the use of *in vivo* experimental animal and/or human data to estimate key kinetic parameters such as uptake, metabolism and elimination. Some agencies also require the use of separate *in vivo* data to demonstrate model validity. However, it has become increasingly difficult to conduct controlled exposures of human subjects to chemicals of concern, other than for pharmaceuticals. The need for live animal studies is also being challenged, particularly in the EU, due to both ethical and practical (cost, throughput) concerns. Therefore, requirements for *in vivo* testing will increasingly limit the potential application of PBPK modeling in risk assessment, and agencies will need to consider whether *in vivo* validation data is truly necessary for assessing the fitness of a model for the specific purpose of its use in a particular risk assessment. To support these decisions, PBPK model evaluations should make greater use of uncertainty analyses to estimate the potential reduction in model uncertainty associated with the collection of additional data; that is, to determine the added value of a proposed study (Clewell et al. 2008; Keisler et al. 2014; Wilson 2015).

The original chloroprene PBPK model (Himmelstein, Carpenter, Evans, et al. 2004) was not used by USEPA (2010) because the agency considered it necessary to have blood or tissue time course concentration data from an *in vivo* study to adequately validate the model. The study reported here was conducted to address this requirement and we have now demonstrated that the chloroprene PBPK model accurately simulates these *in vivo* blood time course validation data.

No *in vivo* validation data for chloroprene is available in the human, and it is unlikely that such a study could be performed given the current classification of chloroprene as "likely to be a carcinogen" (USEPA 2010). However, the sensitivity analyses reported here suggest that such a study would not provide significant added value for demonstrating that the PBPK model is fit for purpose for a chloroprene risk assessment. The validity of the model instead derives from the biological validity of the physiological and biochemical underpinnings of the model structure and parameters. The key parameters for performing a risk assessment for chloroprene are those for lung metabolism, and a human *in vivo* study would not be able to provide informative data for those parameters. As shown in Figure 5, blood concentrations of chloroprene associated with inhalation are insensitive to lung metabolism, and depend only on alveolar ventilation, cardiac output, blood:air partition coefficient and fractional blood flow to liver that serves as the primary site of metabolic clearance.

The limited value of human *in vivo* data for determining whether a PBPK model is fit for purpose in a risk assessment based on target tissue metabolism was also an issue during the development of the PBPK model of methylene chloride (Andersen et al. 1987), where a similar dose metric was used: average daily metabolism of methylene chloride by glutathione transferase (GST) in the lung per gram lung. Although the model accurately reproduced blood and exhaled air concentration time-course data from multiple studies with human subjects, the *in vivo* data were not adequate to estimate the rates of GST metabolism in the liver and lung. Instead, it was necessary to estimate the rate of GST metabolism in the human liver by allometric scaling from animal data (Andersen et al. 1987), and to then estimate the rate of GST metabolism in the human lung using the ratio of specific activities for GST metabolism in liver and lung measured *in vitro* by Lorenz et al. (1984).

Conclusion

A PBPK model of chloroprene that relies solely on data from *in vitro* studies for its metabolism parameters accurately predicts the *in vivo* time course for chloroprene in the blood of female mice exposed by nose-only inhalation to the 3 concentrations used in the chloroprene 2-year cancer bioassay. The human lung cancer risk estimated using the PBPK model is lower than the USEPA (2010) risk estimates based on inhaled concentration by a factor of 137. Similar large differences between PBPK-based risk estimates and estimates based on inhaled concentration have been seen in previous inhalation risk assessments for chemicals where toxicity results from the production of reactive metabolites (Andersen et al. 1987; Clewell et al. 2001). Given the potentially high impact of species differences in pharmacokinetics on estimates of human risk and the potentially limited value of *in vivo* data, particularly human data, for validating some PBPK models, future requirements for validation of a PBPK model using *in vivo* data should be evaluated on a case-by-case basis to determine the potential added value of the studies before making them a condition for acceptance of a PBPK model in a risk assessment.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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Message

From: Ted Broyles [Ted.Broyles@LA.GOV]
Sent: 3/14/2019 1:12:46 PM
To: steven.shermer@usdoj.gov; robyn.hanson@usdoj.gov [Robyn.Hanson@usdoj.gov]; Lannen, Justin [Lannen.Justin@epa.gov]
Subject: Butler v. LDEQ et al
Attachments: 118 Order and Reasons granting all 12(b)(6) motions.pdf

FYI

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Message

From: Lannen, Justin [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=B6A08938C4444196BABDE5BF47045EC6-LANNEN, JUSTIN]
Sent: 3/5/2020 11:12:44 PM
To: Ted Broyles [Ted.Broyles@la.gov]
Subject: QAPP - email 1 of 3
Attachments: Draft SPOD Monitoring QAPP 02032020 p 1-49.docx

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Message

From: Lannen, Justin [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=B6A08938C4444196BABDE5BF47045EC6-LANNEN, JUSTIN]
Sent: 12/23/2016 5:49:16 PM
To: Ted Broyles [Ted.Broyles@LA.GOV]
Subject: RE: Clean AOC
Attachments: Govt mark up 12.23.16.docx

You bet.

I would still recommend you send Bob BOTH the fully clean one and the completely marked-up version (attached for your convenience – "Govt mark up 12.23.16).

Thank you,

Justin

From: Ted Broyles [mailto:Ted.Broyles@LA.GOV]
Sent: Friday, December 23, 2016 11:41 AM
To: Lannen, Justin <Lannen.Justin@epa.gov>
Subject: RE: Clean AOC

Nice work. Thanks….

From: Lannen, Justin [mailto:Lannen.Justin@epa.gov]
Sent: Friday, December 23, 2016 11:39 AM
To: Ted Broyles
Subject: Clean AOC

Attached